The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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The Pumping Engines for the Pittsburgh Water Works.

The history of the new water works at Pittsburgh, briefly described in our issue of February 6th, is such an admirable illustration of the extreme stupidity (or worse) with which municipal affairs involving some degree of scientific skill and judgment are often managed, that we may be pardoned if we refer to it somewhat in detail. It may serve as a warning to other municipalities, and some day taxpayers, who would otherwise be groaning under heavy burdens, may rise up and call us blessed.

The old system of water works at Pittsburgh, which was a very good one, had ceased to be adequate to the supplying of the city with water, especially certain of the suburbs that had been annexed. In 1868, preparatory to undertaking the new water works, Mr. W. Milnor Roberts, the eminent engineer, who has lately received an appointment from the Emperor of Brazil, was appointed to report on the source of supply, location of the pumping works, &c. For our purpose it is only necessary to state that he recommended two reservoirs, one 250 feet above the Allegheny River—the source of supply—and the other 500 feet above the river. He also recommended pumping engines to supply 30,000,000 gallons daily, the engine houses to be so planned that additional engines could be put up as needed. As his report was only preliminary, he recommended that extensive and accurate surveys should be made before finally determining the main points of the work, especially the reservoir sites.

In March, 1871, Messrs. E. S. Chesbrough and Moses Lane, whose ability and experience as hydraulic engineers are too well known to need any commendation, after extensive and complete surveys made a report, recommending among other things three reservoirs—one at an elevation of 228 feet, the second at 356 feet, and the third at 550 feet—all the water to be pumped into the first, or Brilliant Hill reservoir, to supply 16,000,000 of the 20,000,000 gallons needed, and from this to be pumped to the second, or Huron Hill reservoir, which would supply 3,500,000 gallons per day, and a water pressure engine to pump to the highest reservoir, which would supply 500,000 daily. Two pumping engines, capable of throwing 24,000,000 gallons daily, were to supply Brilliant Hill from the river, and two smaller ones pumped the supply for this to the Huron Hill.

Here it will be seen were three eminent engineers virtually concurring in their opinion, especially on the point to which we wish to call attention—a low level reservoir at 228 feet, into which all of the water from the river should be pumped, and from which the other reservoirs were to be supplied. The Board of Examiners adopted these reports with some unimportant modifications. It will also be noticed that, according to the report of the last named gentlemen, four-fifths of the water required to supply the city could be drawn from the Brilliant Hill, or lower reservoir, 228 feet high. This plan was adopted; work was begun on the two reservoirs, and a pair of engines contracted for in August, 1872, to pump into the lowest reservoir.

In December, 1873, Mr. Roberts was again called upon to examine the work and report. To his utter surprise he found two pairs of engines under contract, both to be placed at the river, and each capable of pumping, according to the estimate of the mechanical engineer, Mr. Lowry, their inventor, 40,000,000 gallons daily to the hight of the Hiland Avenue reservoir. He also found that, though the engines were thus contracted for, work was still progressing on the low-level reservoir as though there had been no change in the plans—that is, the water works were being built on two different plans.

Now, if these facts do not show the most utter stupidity on the part of somebody, we are at a loss to know what to call it. Four-fifths of all the water needed by the city is pumped 128 feet higher than necessary. Four engines of great power are provided to throw this water to the enormous hight of 356 feet, these four engines having a capacity of over four times the amount then needed, and being sufficiently powerful to supply, on the statements of the engineer, a population of a million, with the high average of 80 gallons a day—more than the city would need until the next Centennial, in all probability. If this is not stupidity, we should be obliged to some reader if he will give us a proper name for it. The lower-level reservoir was finally abandoned after an expenditure of over $100,000, and it was decided to pump all the water through a 50-inch main instead of 2-36, as recommended by Messrs. Chesbrough & Lane. This action was taken on the recommendation of the mechanical engineer, Mr. Lowry, on the ground that it would be cheaper. It would be interesting to have a statement of how this is proven. Mr. Roberts conclusively shows the contrary in his report to which we allude. As it shows the sinning against light of Pittsburgh Councils, we give Mr. Roberts' estimates of five schemes.

Scheme 1.—(Proposed by Engineers Chesbrough and Lane.) Two engines at river to pump into first reservoir 228 feet, one engine at first reservoir to pump into second reservoir 356 feet.

Cost per day..... $577.47
" " million gallons..... 28.86

Scheme 2.—(Proposed by Mechanical Engineer Lowry.) All the water to be pumped direct to high reservoir, 356 feet, and abandoning the first reservoir.

Cost per day..... $826.92
" " million gallons..... 41.34

Scheme 3.—Abandoning one pair of Lowry engines. (The two pair were already contracted for.) Pumping with remaining pair to first reservoir, and putting up an engine at first reservoir to pump to second reservoir, assuming $50,000 could be saved on foundations.

Cost per day..... $646.93
" " million gallons..... 32.34

Scheme 4.—Abandoning one pair of Lowry engines, abandoning first reservoir and pumping all the water direct into second reservoir.

Cost per day..... $726.53
" " million gallons..... 36.32

Scheme 5.—Completing both engines and both reservoirs, and pumping four-fifths water into first reservoir and one-fifth into second.

Cost per day..... $751.99
" million gallons..... 37.60

Summary of Results.

Cost of supplying 20,000,000 gallons per day at appropriate levels.

	I.	II.	III.	IV.	V.
Cost per day..	$577.47	$826.92	$646.93	$726.53	$751.99
" mil. gal.	28.86	41.34	32.34	36.32	37.60

From this it will be seen that the scheme of the mechanical engineer, No. 2, was the most expensive of the five, costing per day $249.45 more than Scheme 1, or, in one year, $91,049.25 more. Now, with this testimony before their eyes, the committee quietly went ahead with the scheme of the mechanical engineer, and passed the report of one of the greatest engineers in the world by with indifference.

Mr. Roberts shrewdly refrained from expressing an opinion in regard to the design of the engine in his report, as it was not included in the work which he was to perform. In his report he says:

"There has been no intention in any of these remarks to pass an opinion adverse to the merits of the engines designed by Mr. Lowry. That is a matter by itself. If properly proportioned in all their parts to the work required of them, I think they should do good service; but I cannot recommend the adoption of a system of pumping all the water to the hight of 356 feet when there is no necessity for it, and when the objections to it are so manifest."

But his objections proved to have but little weight with the committee, as was subsequently shown.

It would be impossible to put this engine into any class of known pumping engines, and thereby give the reader any idea of its design. It resembles the Cornish engine, in that it has a beam which works the pumps, but there resemblance ceases. The inventor calls it a graduating plunger pumping engine. It is a horizontal engine, the crosshead being connected by a pitman with one corner of a triangular beam, the other two corners of the beam being connected by connecting rods 33 feet long, with the plungers which are in the pits. From the corner of the beam to which the cross-head is connected, a pitman carries the power to a crank shaft and fly-wheel. The beam is supported on two pillow blocks, resting upon the bed-plate about 10 feet above the center line of the cylinders, and has a motion in a plane parallel to the vertical plane passing through the center line of the cylinders. The plungers, pump barrels, air chambers and valve chambers are attached to, and directly under, the bed-plate. The plungers are weighted equal to the weight of the column of water, so that the work of the engine is to lift this weight, and it, in descending, forces the water up the hill. To raise the water 356 feet, about 110 tons are put in the plunger.

There are three radical faults in the design of the engine. The first is the circuitous route through which the power is transmitted before it is applied to the work to be done; second, the placing of the air vessel and pumps upon the valve chamber, and connecting all with the bed-plate, making it impossible, should a valve chamber crack, to repair it without tearing down all the machinery in the pit. This fault has already been discovered, for we understand that one valve chamber is to be taken out, and the cost of taking the old one out and putting a new one in, will be ten times as great as that of the casting itself. The third defect is in the graduating motion upon which Mr. Lowry claims his patent, and in coupling the two engines at right angles when this motion is used. The inventor claims that connecting the pumps to a triangular beam gives a slow, steady motion to the pump at the beginning of the stroke, and that, as the beam begins to assume a horizontal position, it travels faster, the steam in the cylinder being, at the same time, reduced in pressure by expansion in proportion to the increased velocity of the plungers. This principle might be all very well if the engines worked singly and without condensation, but when a vacuum is obtained of, say, 12 pounds, that pressure is constant during the stroke, and does not diminish—as it should to carry out the principle of the engine—like the expanded steam; and when the engines are coupled at right angles, one engine is at the center of its stroke, and the pressure should be diminishing; but at this moment the other engine receives the fresh steam at the beginning of the stroke, and, consequently, the first engine's motion is accelerated and that of the second retarded; or, in other words, one drags and the other is pushed ahead, giving a result in direct opposition to the principle upon which the engine is built.

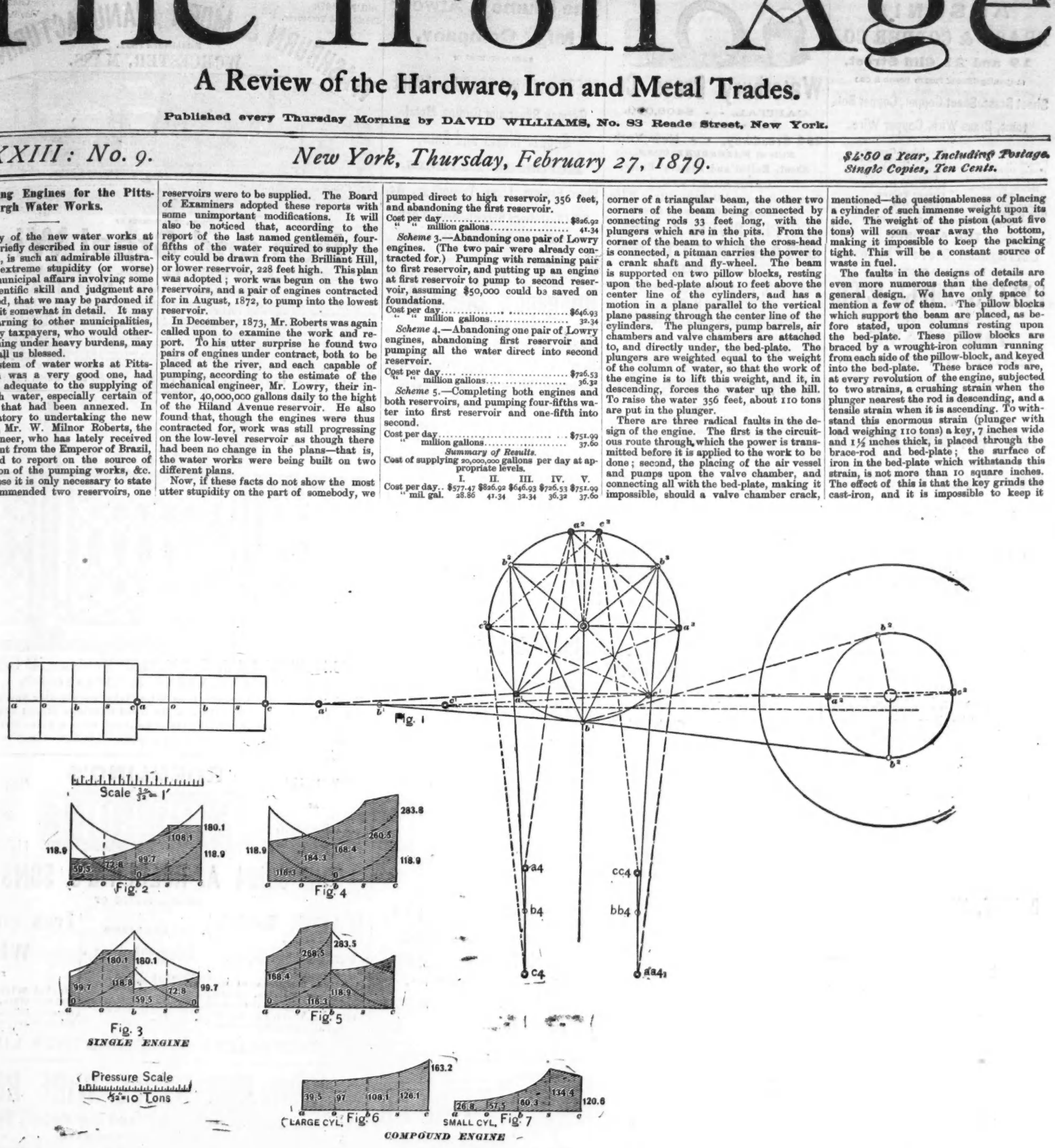
Another fault in general design may be mentioned—the questionableness of placing a cylinder of such immense weight upon its side. The weight of the piston (about five tons) will soon wear away the bottom, making it impossible to keep the packing tight. This will be a constant source of waste in fuel.

The faults in the designs of details are even more numerous than the defects of general design. We have only space to mention a few of them. The pillow blocks which support the beam are placed, as before stated, upon columns resting upon the bed-plate. These pillow blocks are braced by a wrought-iron column running from each side of the pillow-block, and keyed into the bed-plate. These brace rods are, at every revolution of the engine, subjected to two strains, a crushing strain when the plunger nearest the rod is descending, and a tensile strain when it is ascending. To withstand this enormous strain (plunger with load weighing 110 tons) a key, 7 inches wide and 1½ inches thick, is placed through the brace-rod and bed-plate; the surface of iron in the bed-plate which withstands this strain, is not more than 10 square inches. The effect of this is that the key grinds the cast-iron, and it is impossible to keep it tight. All the parts of the engine, such as the cranks, fly-wheel shaft and fly-wheel connecting rod, have been designed enormously large for the work to be done.

In regard to the tests of the samples mentioned in our last number, we have since learned how those tests were made, and the mode of testing iron, we must own, was not only new, but unjust to the contractor, as it was not reliable proof of the strength of the iron. This mode was to take a core drill, bore out a core of iron 1½ inches in diameter from the wall of the casting, and transversely through it; this was turned to the required shape and size, pulled in a testing machine, and a result obtained which could no more be depended upon than if it had been guessed at. Iron, as every mechanic knows, in cooling, cools first at the surface and sets, the center remaining for a longer time fluid, it cooling last; the iron consequently draws away from the center, becomes compressed and close grained, leaving the center spongy. The contractor not relishing this mode of testing, which invariably showed a less tensile strength than his contract called for (25,000 lbs.), got the affidavits of the best engineers in the city to prove that this mode of testing iron was unfair. The affidavits are interesting reading, but unfortunately they are too voluminous to publish. Among them are the sworn statements of some of the best engineers in Pittsburgh; one and all saying that iron tested in the way this was would not show within 30 to 50 per cent. of its real tensile strength.

Such are some of the facts regarding these

(*Concluded on page* 5.)



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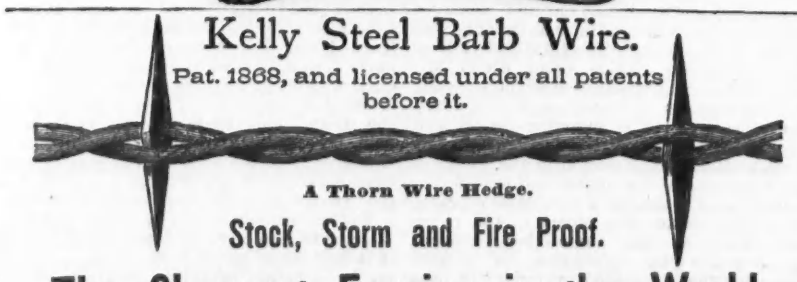

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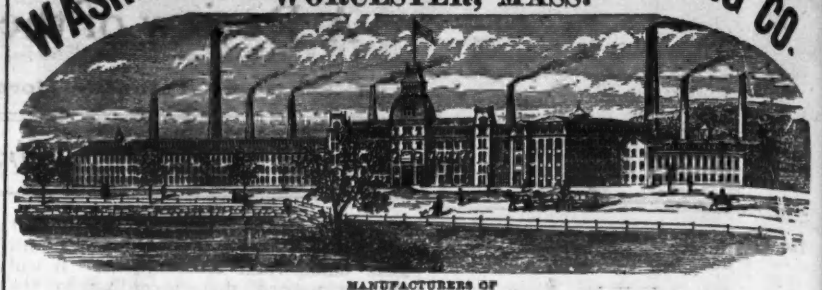

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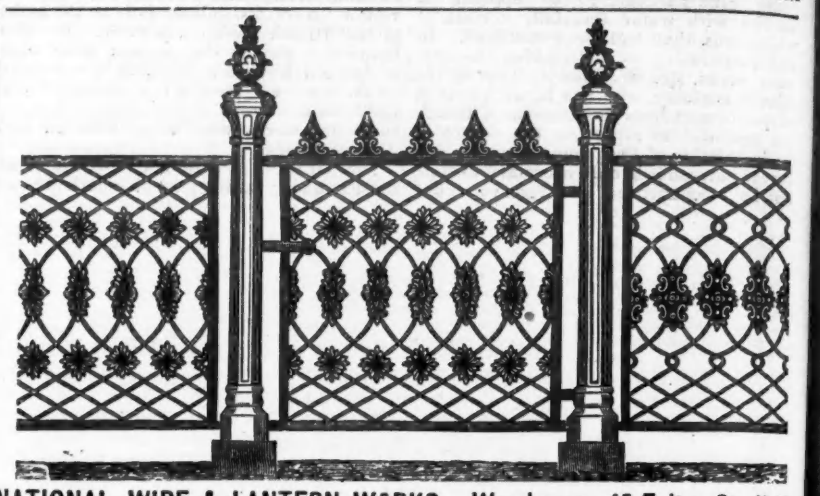

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The Knights of Labor.

A Scranton (Pa.) correspondent of the Philadelphia *Record* gives the following account of the labor organization known as the Knights of Labor. It is probably greatly exaggerated, but we give it for what it is worth:

About ten years ago a secret organization, bearing the name of the Knights of Labor, was started in Philadelphia by James L. Wright, then a garment cutter, but now a merchant tailor at 315 South Second street. The operations of the order were confined to the garment-cutters' trade of that city until three years ago, when it was first proposed by Mr. Wright to extend the order into other trades. In six months from the commencement of this work 64 assemblies, every number denoting a different trade, were in active work in Philadelphia, and numbering not less than 17,000 members. From these the organization spread.

Two of the most powerful assemblies were the locomotive engineers and locomotive firemen, and through their agency new assemblies were established along the line of the Pennsylvania and the Philadelphia and Reading railroads. Pittsburgh, Scranton, Pottsville and Shenandoah, of this State, soon became the headquarters of strong assemblies. Newark and Jersey City, in the State of New Jersey, as well as New York city, soon organized. The work of organization went on, and is still going on, and now its effects are felt.

The present Grand Master Workman of the entire organization is Uriah S. Stephens, who resides at 2347 Coral street, Philadelphia. The Grand Secretary is Charles H. Letchfield, whose headquarters are at Marblehead, Mass., from which place he has recently been elected a member of the Legislature through the aid of this organization. The workings of the order are secret in character, and it was not until recently that the existence of the society was credited.

The greatest care is exercised in inducing men to join, and nothing as to the nature of the organization is developed until the oath of secrecy is administered. The assemblies generally meet in some out-of-the-way place, where those who have signified their willingness to become members are reported to the assembly, composed of the tradesmen of which he is a member. The name is referred to an investigating committee, which examines into his character, and, without his knowledge, ascertains his ideas of secret organizations. If he is reported favorably, the person who first recommended him will invite him to attend the next meeting of the organization.

The applicant remains in a small anteroom until the assembly completes the opening ceremonies, which is done by reading a portion of Scripture. This done, the lights in the room are lowered until it is impossible to distinguish faces. The Grand Sage, who is the chairman of the investigating committee, now enters the ante-room, disguised with a large black cloak and head-cover that completely envelop the body and head, while the face is protected from recognition by a black mask. In a solemn manner the following questions are asked, and the answers recorded in a little book which the investigator holds in his hand:

"Your name, birthplace, residence and business?"

"Do you know of any reason why, by joining a secret organization designed to protect labor, and especially your trade, you would be committing a wrong against God, man or your country?"

The answers are made known to the assembly, and, if satisfactory, the Sage brings the bewildered man into the darkened chamber. In the center of the room, and surrounded by the officers of the assembly, and, with one hand resting on the Bible, a solemn oath is administered. He swears that he will not divulge any of the secrets of the order, that he will not mention its name or the fact of its existence to anyone but those whom he apprehends will become members, and even in such case that nothing definite is to be made known. "You will obey the mandates, so far as they are consistent with law and order; that are given out by the assembly. You swear to assist your fellow-members, regardless of the circumstances of his trouble, whenever you find one in such. If you notice anything in the oath that you will not subscribe to, you are asked to state it."

If the candidate object to anything material in the oath, and will not conform to it, he is conducted to the ante-room and permitted to depart, and unless he were able to recognize a voice he would not know with whom he had been talking. If all is well, the lights are turned on, and, in all probability, the newly-fledged Knight finds himself surrounded by many of his shopmates and other acquaintances in the trade. He is then given the pass-words and secrets of the society.

The purpose of the order is to maintain a high scale of wages, and to assist in providing members with employment. Different means of maintaining the scale of wages are employed at different times, according to the circumstances. If a manufacturer in a certain business gives notice to his employees that he will at a certain day reduce the wages, the assembly, composed of tradesmen in that line, will consider the matter. The assembly first inquires as to the number of men working in the place who are members of the organization. The state of the trade, the time of the year, the amount in the hands of their treasurer, are all considered before it is resolved to resist the reduction.

If the reduction is a threatening one, or likely to extend, the general assembly is consulted upon the matter. If it be decided not to resist, the amount of the reduction is placed upon the minute book, and is ordered to be reconsidered at a certain day in the season of the year when this particular trade is generally in prosperous condition. Then, without the slightest notice to the manufacturer, and generally while he is in a great emergency, his employees strike for the old price.

The general assembly is known as a district, and is designated by number in the same manner as the ordinary assembly. It is composed of a delegate from each of the bodies in the county; no person can be a delegate, however, unless he has been an active member of the organization for a period of six months. From each district one delegate is elected to the grand body, which gathers together representatives from all parts of the country and meets once a year. This body elects the Grand Master and the Grand Secretary. Uriah S. Stephens, the present chief, was first elected at Reading in January, 1878. He and the present secretary were again elected on the 6th of January of the present year, at a meeting of the grand body held in St. Louis. With the usual secrecy of the organization, this body, numbering over 200 men, collected in St. Louis, transacted its business during the day, in the evening was addressed by Stephens, and on the following day was treated to a grand banquet by the assemblies of the town, and subsequently departed, whither none but themselves knew; and all this without attracting any attention.

Previous to this meeting, it was customary to tax each member of the organization one cent per capita per annum, by which they created a reserve fund. At the 6th of January meeting this tax was increased to two cents per capita. Out of this fund the national officers are paid, the salary of the Grand Master being $200 per annum, and that of the Grand Secretary being $800.

According to the report of the grand body, there is a total membership in the United States of over 800,000. The annual receipts of this body for the reserve fund during the last year amounted to $7580. This was found to be inadequate for the expenses of the national organization.

Many prominent men in this State are members of the organization. Among them are the three present members of the Legislature from Luzerne County, and the Mayor of Scranton, P. V. Powderly. As the order is very strong in Reading, there is no doubt but what it took an active hand in the late election.

The influence of the order has also reached the bench of the Judiciary, for they have one of their members on the bench in this State, but his name is omitted for reasons that will readily be understood.

American Goods in England.

A "Traveled Englishman" writes to the London *Standard* in the following manner as to the intrusion of American goods on the British markets:

How is it, I want to know, that my wife's maid, when she went to Aix les Bains, to Homburg and to Florence to buy calico, found in shops where two years ago nothing but English goods were kept, that the calico or cotton in stock was of American manufacture? I am not a judge of this article myself, and I really do not pretend to know whether the American goods are better or worse than those formerly supplied from the English markets. What I do know is that in this, one of our own staple manufactures, we appear to have been fairly beaten out of the field upon the Continent, and that in each case the shopkeeper, when applied to for an explanation, declared that he preferred American to English materials because he got a larger profit upon the former than upon the latter.

How is it, again, that here in England, if I want tools for my garden or my workshop, I am constantly being invited by my ironmonger to try new American "notions," in the shape of spades and hammers, and saws and chisels and axes? Some months ago I read a letter of Mr. Gladstone's upon a subject on which his authority can hardly be contested. In it he gave his opinion upon the common American woodman's ax, and described—as I happen to know, quite accurately—the difference between it and the English article manufactured at Sheffield. The comparison, I need hardly say, was all in favor of the Yankee production. Sheffield is too conservative—in its manufactures, I mean, not in its politics—to make an ax of the best shape. So the sharp American comes in and wins. And he does this not merely in axes and the other tools I have mentioned, but in locks, bolts, stoves, lamps and a thousand and one other household requisites which a dozen years ago were the peculiar productions of this country. You have only, indeed, to cast your eye over your own household, sir, in order to see to how large an extent the English manufacturer has been beaten, even in articles of domestic use. Nor is it in the hardware trade only that we seem now to be getting flooded with American goods. American leather comes here to be made up into shoes; and our famous English carriages are, to a large extent, built out of materials which have crossed the Atlantic, and for which the American has been duly paid. "Glue, hair and sandpaper" are mentioned in a recent copy of the Philadelphia *Ledger* as being now among articles largely exported to this country; and even slates—shades of the Welsh magnates!—are now quarried in the United States in order to roof in our English homes.

Can any of your readers tell me how all this is brought about? And is not the fact alone sufficient to account in a large measure for the present depression in our manufacturing industries? I do not grumble because if I want tomato sauce with my cutlets at this season, it is probably made out of American fruit; nor can I complain because my grocer, my butterman, and probably my butcher also, deals so largely in American goods of all kinds, for I freely admit that as a source of food supply the United States is naturally infinitely superior to our limited and over-populated country. But what I want to know is why, in the special manufactures which were once entirely ours, and which only a few years ago belonged to us more largely than to any other country in the world, we now seem to be running a bad second to the United States. Why, sir, even the cigarettes which I smoke are made in Richmond, Va., and the pen with which I write comes, not from Birmingham, but from an American manufactory.

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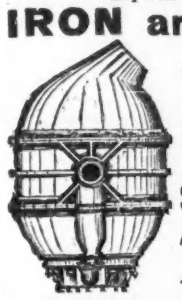
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(*Continued from page* 1.)

The Pumping Engines of the Pittsburgh Water Works.

engines and Pittsburgh's water works. An engine on a similar principle is at work in Allegheny City, Pa. In the same issue of *The Metal Worker* in which our editorial remarks was copied, was a report on the water works of that city, which is interesting in this connection: "The Lowry engine, which has occupied considerable space in the daily papers of that city, has been, the superintendent says, very unsuccessful ever since she was put into service, to which cause a large increase in the expenses of the pumping department is charged." A test of this engine was made some time since, and the duty of a nine hours' trial was 35,958,917.

In the accompanying diagram we have given a graphical representation of the forces which are exerted on the pin of the triangular beam to which the cross-head is connected. These forces are two in number. First, the power exerted by the steam in the cylinder; and, second, the weight of the plungers. As the work required of the engine is lifting the plungers, the areas of these two diagrams should be equal.

Fig. 1 represents the compound engine and The beam in three different positions; that is, when the piston is at the middle of its stroke, position b; and at each end, a and c. The beam for these positions of the piston is in position, $b^1\ b^2\ b^3$, $a^1\ a^2\ a^3$, and $c^1\ c^2\ c^3$, respectively; the lines running from the beam to a^4, $a\ a^4$, &c., represent the pump rods, to the ends of which the plunger is connected.

To find the pressure exerted on the crank-pin b^1 by the weight of the plungers, we have only to calculate the leverage of each plunger and rod for the different positions, subtract them, and the difference will be the amount of pressure which will have to be exerted by the steam. For example, when the beam is in position ($b^1\ b^2\ b^3$) the leverage of the two plungers are equal, and the pressure which they exert on the crank-pin will be (o), as it is represented in Figs. 2 and 4 at b. Again, in position ($a^1\ a^2\ a^3$), the difference in leverage of the two plungers is 118.9 tons, as it is also in position ($c^1\ c^2\ c^3$). Drawing a line representing this pressure, we get the lower curved line in Figs. 2 and 4. This curve, which represents the pressure exerted on b^1 by the plungers, when the engine is running light, shows this pressure to be, at the beginning of the stroke, 118.9 tons; at the middle of the stroke, o (the beam being in equilibrium), and at the end of the stroke 118.9 tons. When the engine is pumping water, the pressure being constant, it will be represented by a curve parallel to the first, but at a distance above it representing 110 tons.

To counteract this force we have the pressure exerted by the steam on the piston, and represented in the diagrams by the shaded portion. The pressure is taken at 100 lbs., cutting off at one-quarter, and vacuum at 12 lbs. The reader can see for himself how near the two areas equal each other.

Figs. 2 and 3 are for the single-cylinder pair of engines coupled at right angles, showing the cylinder pressures and plunger pressure for the corresponding position in which each engine is during the stroke.

Figs. 4 and 5 represent the same thing in the compound engines.

Figs. 6 and 7 represent the diagrams of the steam pressure in the large and small cylinders, and, being added together, give us the steam force exerted on the pin b^1, as represented by the shaded portions of Figs. 4 and 5.

In this diagram we have taken no note of the velocity of the piston, as it does not affect the results.

Poisonous Tin Plate.

The Boston *Journal of Chemistry* says: "Attention has recently been called to a new risk of chronic poisoning by the old enemy—lead. What we call "tin" vessels—that is, sheet iron coated with tin—are in daily use in every household in the land. They are cheap, durable and convenient, and have been considered perfectly safe for the thousand culinary purposes to which they are devoted. They are safe if the tin plate is honestly made; but, unfortunately, this is not always to be counted upon. Tin is comparatively cheap, but lead is cheaper; and an alloy of the two metals may be used in place of the dearer one, with profit to the manufacturer, though with serious detriment to the user. The alloy is readily acted upon by acids, and salts of lead are thus introduced into food. The Michigan State Board of Health has lately been investigating this subject, having been led to do so by a letter from a physician who found that certain cases of what had been taken for chorea were really *paralysis agitans*, which could be traced to this kind of lead poisoning. Other cases were brought to light in which children had died of meningitis, fits and paralytic affections, caused by milk kept in such vessels, the acid in the fluid having dissolved the lead. Malic, citric and other fruit acids are of course quicker and more energetic in their action upon the pernicious alloy. The danger is the greater because lead salts are cumulative poisons. The effect of one or two small doses may not be perceptible, but infinitesimal doses, constantly repeated, will in the end prove injurious, if not fatal.

"Analysis of a large number of specimens of tin plate used in culinary articles showed the presence of an alloy with lead in almost every instance, and often in large quantities. It is safe to assert that a large proportion of the tinned wares in the market are unfit for use on this account.

"That we may not be accused of exciting fears which may be groundless, we will inform our readers how they can settle the question for themselves by a simple and easy test. Put a drop of strong nitric acid on the suspected 'tin,' and rub it over a space as large as a dime. Warm it very gently till it is dry, and then let fall two drops of a solution of iodide of potassium on the spot. If lead is present it will be shown by a bright yellow color, due to the formation of iodide of lead."

This article, like most others upon the subject of lead poisoning, doubtless has no small amount of truth in it. That a great deal of tin plate is used on which the coating is more or less contaminated with lead is doubtless true. It is also true that lead, is a cumulative poison, and is not thrown off from the system, as many other poisons are, when taken in small doses. It is also true that the mild acids of fruit, milk, &c., do remove the tin and lead from the surface of the plate, and it then finds its way into the stomach easily, and in a form likely to do mischief when a sufficient quantity has accumulated in the system. Another fact may as well be stated in this connection, which is that the tin obtainable in commerce is rarely pure, containing usually a great variety of metals which are not removed in the ordinary methods of purification. Under any ordinary circumstances, it is comparatively easy in a family to prevent poisoning by avoiding the use of tin vessels in preparing acid fruits and vegetables for the table. There is not enough known on the subject to say with certainty that cases of lead poisoning have occurred from the use of the better grades of tin plates. It is quite possible that in the reported cases, the lead or antimony which caused the mischief came from the solder and not from leaded tin plates. There is frequently great carelessness in the use of solder upon the inside of dishes used for cooking, and we think that to this cause, rather than the lead in the tin, is to be traced the trouble in regard to lead poisoning. In canned goods the presence of large drops of solder is the rule rather than the exception, and it is easily demonstrated that one or two drops of this kind contain as much lead as could well be put into the whole inside coating of the can, had the manufacturer's object been to put as much lead as possible in the coat. It is evident that the quantity of lead in the better quality of plates is small, or they would tarnish more rapidly. On this ground alone we are inclined to attribute the trouble noted in the article to the solder rather than the tin. Until we have further proof, our advice will be not to use tin vessels for cooking fruits, and by all means to look out for the solder and see that there is as little as possible comes in contact with the food.

Care of Tools in the Shop.

The *American Machinist* has some very good suggestions concerning the advantage of care and system in the treatment of shop tools. First cost of tools seldom represents their ultimate cost, whether it becomes necessary to repair them or not. If a good mechanic makes a tool last a year in constant usage, while his careless neighbor uses up one of the same kind in six months, the cost of the latter should be accounted twice that of the former. When repairs are made their value must be added in computing the whole cost of the tool.

One primary reason why some shops can show a greater profit on a given amount of work, is because they get more service out of their tools. This is just as evident when tools are cheap as when they are dear, for the products of mechanical labor fluctuate the same as the first cost of tools; and if a large part of the income of business goes for working tools and repairs to the same, balances on the right side of the ledger are likely to be diminutive, if indeed they appear at all. It is the first requisite that tools and machines should be adapted to the work to be performed. Fine tools should not be used on heavy, coarse work. They must also be kept in good working order, cutting edges well sharpened and bearing surfaces lubricated, shafting kept clean and pliable and at the correct tension, rust prevented, emery wheels and grindstones trued up, and dirt kept out of all wearing parts.

Machines should be mounted on stable foundations, and run neither above nor below the proper speed required to do the work. Small tools demand as much care as large ones, and a careless or inexperienced workman will often spoil more than the amount of his wages in files, drills, chucks, reamers, taps, dies, calipers, wrenches and the like, unless carefully looked after by the master mechanic. It is therefore very essential, in order to insure proper care of tools, that workmen know just how to use them. All small tools should be laid away systematically in a dry place when not in use. In large shops a room should be set apart for the purpose, and a man detailed to take charge of it and keep the tools in good working order. There is no part of a large machine shop from which an outsider can form a better judgment of the general management than by an observation of the tool-room. The best economy is established by securing none but the best tools at the outset, for in the long run they will be found the cheapest. As a rule, it is expensive trying experiments by purchasing tools of new and untried patterns or material. New machines and tools are often constructed so as to leave no reasonable doubt of their successful operation, but this is not invariably the case. It is always safe to buy those about the working of which there is no doubt. Second-hand machinery can often be obtained in good order at very low prices, if the purchaser has extra time at his disposal to look it up, but when machinery is much worn its value is questionable at any price. It is not only easier, but a greater satisfaction to take care of good tools than of poor ones.

Forthcoming Exhibition in Belgium.—An exhibition of hydraulic machines is to take place in Verviers, on March 15 of this year. Exhibitors will have nothing to pay for the space allotted to them, nor will any rewards or official report be given. The idea is simply to offer a free field for fair competition among manufacturers, so that those who best adapt their machinery to the requirements of the public at large may have the greatest chance of receiving orders, and of increasing thereby their trade abroad.

Mining tools do not cost more than half as much now as in the early days of Joplin, Mo., says the *News* of that place. Good picks that sold for $2 each can now be bought for $1, and a shovel that cost $2 some years ago can now be bought for 75 cents.

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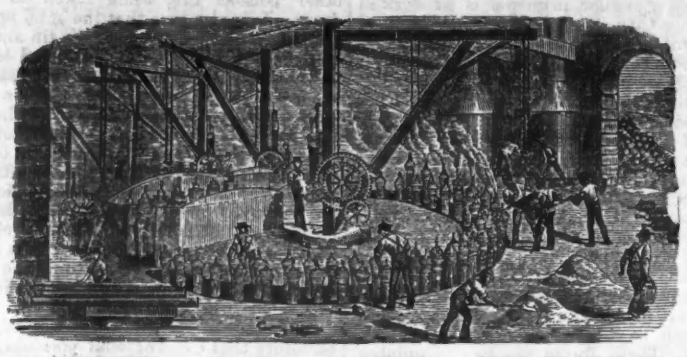

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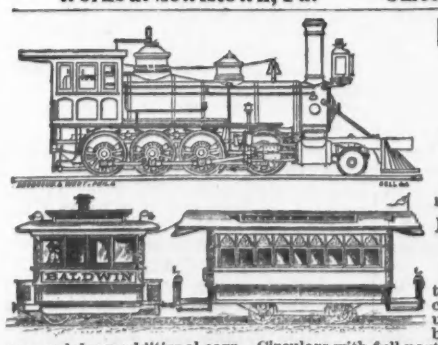

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Strength of the "Locomotive" Boiler.

The locomotive form of boiler is such a general favorite where economy of weight and rapid steaming qualities are desired, that we find it used for almost every purpose where a steam boiler is needed. The boilers are employed in mills, on steamers for road and agricultural engines and for steam heating. The following extracts, from a very suggestive article in the *Railroad Gazette*, will be read with great interest by engineers and mechanics. It was written with especial reference to the locomotive, yet it is equally applicable to all boilers of this shape:

Of late years, owing partly to the increase in the size of locomotive boilers, and partly to the numerous explosions that have occurred, the thickness of boiler plates has been materially increased. Twenty-five years ago there were few, if any, used thicker than 5-16 inch. Now, for the larger sizes of locomotives, plates are always three-eighths, and in some cases 7-16 inch thick. Double-riveted seams were seldom found in the older boilers, whereas now it is the rule for horizontal seams, and in some cases for all others; and in the larger engines now in process of construction on the Louisville and Nashville Railroad, the former are treble-riveted. The object of this increase in the thickness of the material and in the method of fastening it together, is to increase the strength of the structures; but a boiler is like a chain, the strength of which is only equal to that of the weakest link, and the misfortune has been that in attempting to increase in resisting capacity of boilers, some of the links have been very much neglected.

A house painter who should fall from a scaffolding by the breaking of a rope, would quite naturally get a stronger one if he survived the fall; but the strong rope would be of little service unless it were securely fastened. Without knowing any confirmatory facts, it is safe to venture the opinion that many more accidents of persons falling from scaffolds are caused by insecure fastenings, than by insufficient strength in the members of the structure. The unfortunate man who undertook to lower his wife from the window of an upper story of the Southern Hotel at the time it was burned, was not mistaken about the strength of the pieces of bedding which he tied together, but he had not the knowledge nor the skill to fasten them, and his knots slipped and his wife was killed.

The weakness of boilers arises generally, not from insufficient material, and perhaps not so often from inferior quality, as it does from the weakness of the attachments of the various parts. Unless there is some reason for a contrary opinion, it may be assumed that riveted work will always be done badly. The chief defects of such work are out of sight, and to a great extent undiscoverable after it is finished. Mismatched and unfilled holes cannot be seen after the heads of the rivets are formed, and therefore such work is less subject to criticism and inspection, and consequently there is little rivalry or pride of excellence in doing it among mechanics. Without the very closest inspection, it is always possible for a workman to hide his blunders and his carelessness. Then, too, there is no strong sense of the necessity of good work of this kind. There is generally a lack of what might be called mechanical moral sense in this respect, and an engineer who should insist upon having first-rate work would find it no easy task to have his orders executed.

In the construction and attachment of the braces, there is more carelessness and ignorance displayed than in any other part of boiler construction. These are seldom carefully designed, and are nearly always left to workmen to arrange. They are seldom deficient in the amount of material of which they are made, but very often in the methods of attachment to the shell of the boiler.

In the attachment of steam domes there is more disregard of the laws which govern the strength of locomotive boilers than anywhere else. In order to give access to the inside of the boiler, a hole from 24 to 30 inches in diameter must be cut into the shell. To make up for this there is the flange which is formed on the base of the dome, and, in some cases, another flange which is turned up on the plate which forms the shell of the boiler. Both of these are cut away by the rivets so that their sectional area is diminished thereby. What is needed here, and what is used in Europe, is a heavy wrought-iron ring around the whole at the base of the dome. This can be riveted either to the boiler shell or to the dome, and in this way it will reinforce the strength of the boiler, which has been diminished at this point.

Broken stay bolts we have always with us. Our present knowledge of the subject has not thus far supplied a remedy for the evil. All we can do is to supply such means as will enable us to discover the leakage as soon as it occurs. Hollow stay bolts plugged on one side are the surest safeguard.

It is a little singular that more effort has not been made to overcome the effects of unequal expansion in locomotive boilers. If we reflect for a moment on what occurs when a fire is built in a locomotive boiler filled with cold water, it will be seen that there must be an enormous strain exerted on it before the whole of it becomes heated. The first effect of the fire is to heat the fire-box plates and tubes. These must expand before the outside shell is even warmed. The expansion due to a rise of temperature from say 70° to 400°, is about 0.002 of the length of the tube, which, if 10 feet long, would therefore be increased in length nearly a quarter of an inch. This pressure must be exerted against the front and back tube-sheets and transferred to the shell of the boiler. The front tube sheets cannot yield, excepting to an almost inappreciable amount. The outside shell will be stretched and the tubes compressed somewhat under the strain; but after making allowance for these effects, it will be seen that the greater part of the strain, due to the elongation of the tubes, must be exerted on the back tube sheet, and this in turn is transmitted to the side sheets and stay-bolt of the fire-box. It is no wonder they are broken.

It is remarkable that no one has devised any method of compensating or permitting this expansion of the tubes without subjecting the other parts of the boiler to excessive strains.

It seems as if there were some grave defects in the principles of constructing locomotive boilers. Whether they can be remedied it is too early to answer, but it is certain that much of the workmanship and the design of the details could be immensely improved, without any increase of knowledge on the part of those who have charge of of their construction, excepting that which every good mechanic should have, and which can be found in elementary books.

The Economy of Electric Lighting.

The lighting of large spaces by the electric light, especially in the experiments made at Paris, has revealed some curious facts as regards the cheapness of this mode of illumination when compared with gas. The *Courrier des Etats Unis* publishes an interesting article on the subject. The author of the article, M. Henri de Parville, takes as a basis the full and able report of M. Cernesson, which has been adopted by the Municipal Council of Paris, and which contains a very careful comparison of the expense of the electric light and gaslight. While it is very certain, says the report, that the electric light furnishes the best illumination for large thoroughfares and public squares, it is not demonstrated that an equally brilliant illumination may not be obtained by using an increased quantity of gas, without incurring the amount of expense involved in lighting by electricity. It has not yet been proved than an economical light can be furnished by electricity. In view of this fact, the Municipal Council of Paris decided upon a series of comparative experiments by lighting the Avenue de l'Opéra, Place de l'Opéra, Place du Théâtre Français, and one large public interior, with electricity for a limited period. The Paris Gas Company at the same time used a number of gas-burners of larger calibre than usual in certain thoroughfares and public places, and the results have been carefully registered and compared, both as to the cost and the degree of illumination. Until M. Cernesson reported upon the question, the cost of the Jablochkoff light was a matter of conjecture, and it is of no little interest, in settling the issue, that the figures which have been obtained in Paris are accepted as correct, not only by the corps of City Engineers and by the engineers of the gas company, but by the engineers of the Paris Electric Light Company. They are, therefore, incontestable. The introduction of the electric light involves three sources of expenditure: First, a motive force to drive the rotary generator furnishing the currents; secondly, the electro-magnetic battery itself, and, thirdly, the electric lamp, or candle of Jablochkoff. The engines employed were each of 20-horse power, driving Gramme generators. Each engine was found capable of running 16 Jablochkoff candles, or, in other words, each candle required for its successful operation a force equivalent to 1.25 horse-power. Four engines and Gramme generators were necessary to the illumination of the Avenue de l'Opéra. The unit of illuminating power adopted was the light produced by a Carcel lamp consuming 42 grams of pure oil per hour. It was first ascertained that 10 gas-burners, each using 140 liters of gas per hour, are equivalent to 11 Carcel lamps, while a single Jablochkoff candle is equal to 30 Carcels. But as it was found necessary to the diffusion of the latter to shade it with an opaline globe, its illuminating power was practically considerably below this standard, being equal to only 18 or 20 Carcels when the horizontal rays were tested, and to only 10 or 12 when the oblique were under examination—a very meager result, indeed, when compared with the actual light generated. The ultimate comparative result arrived at was that one Jablochkoff candle is practically equal to 11 gas jets of the ordinary caliber used for street illumination. But a comparison of the figures of cost showed that the amount of gas used might be so increased as to give an equivalent light without incurring a fully equivalent expense. When a burner consuming 200 liters of gas per hour was used, it required only seven to equal one electric candle. Electricians hope to diminish the waste consequent upon the use of opaline globes, and M. Clemandot's invention—that of using two globes, the one fitting loosely into the other, and filling the space between the surfaces with powdered glass—has favorably impressed the scientific men of Paris. The particles of the thin layer of powdered glass appear to exercise a wonderfully diffusive influence without materially reducing the illuminating power. The cost per hour of running the 62 candles used upon the Avenue de l'Opéra is thus stated by Levy, a competent engineer:

	Francs.
Motive force	3.20
Coal	0.64
Oil for lubrication	1.23
Cost of superintendence	3.20
Sixty-two candles	31.00
Total	45.27

A calculation upon this basis shows the cost per hour of running one Jablochkoff candle to be 73 centimes (about 14½ cents). The electricians count upon a considerable reduction in the amount of motive force and the cost of candles—enough, at least, to bring the cost per hour down to 60 centimes (about 11 4.5 cents). But, even upon this basis, the economical advantage rests manifestly with gas. In effect, then, while a Jablochkoff candle is equivalent to 11 gas burners of the Paris standard, these 11 gas burners cost only a little over 23 centimes per hour—something less than 5 cents. At the present figures, therefore, the relative expense of electric light to that of gas, illuminating powers being equal, is as 73 to 23, and were the cost reduced to the limit urged by electric engineers as possible under existing circumstances, the proportion would still stand as 60 to 23, a very wide margin to be overcome. M. Cernesson's report further compares the questions of relative convenience, liability to get out of order, &c. Each electric lamp (*foyer*) being supplied with four candles, each burning 100 minutes, the whole provision has to be renewed every seven hours, while with gas no such renewal is necessary. He finds that from May 30 to October 10 there were 60 extinctions in all on the Avenue de l'Opéra, lasting from merely a minute or two to 15, 30, 35 and even 45 minutes.

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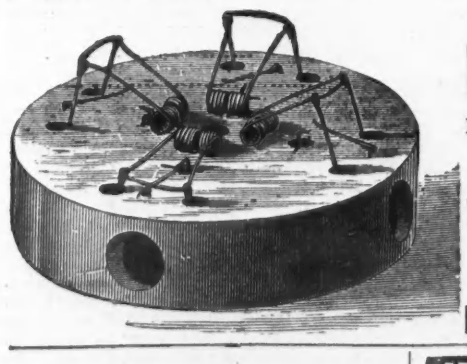

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G. F. Warner & Co., Carriage Clamps.
We have also on hand a general assortment of Hardware

THE GIANT PAD LOCK.

Manufactured by

THE SMITH & EGGE MFG. CO.

(Centennial Award.)

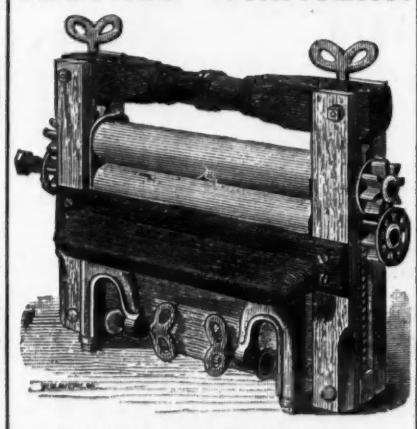
"Superior in Every Respect."

This is one of the **best selling Locks** in the market, and affords the dealer a large profit. It is thoroughly and strongly made—of the best material—very handsome in appearance, and every Lock is warranted.

Orders solicited. Address as above

Lock Box 105, Bridgeport, Conn.

Keystone CLOTHES WRINGERS.



Wood Frame Cog-Wheel Wringers.

No.	Size of Rolls.	Price per doz.
10	10X1¾	$60.00
12	10X1⅞	63.00
16	11X1¾	68.00
18	11X1⅞	71.00

Wood Frame Friction Wringers.

No.	Size of Rolls.	Price per doz.
1½	10X1⅝	$51.00
1	10X1¾	54.00
3	11X1¾	62.00

Self-Adjusting Iron Frame Friction Wringers.

No.	Size of Rolls.	Price per doz.
2½	10X1⅝	51.00
2	10X1¾	54.00
4	11X1¾	62.00

EVERY WRINGER WARRANTED.

☞ Special rates given for export.

Send for price list of other goods for home and export trade.

F. F. ADAMS & CO.,

Erie, Pa.

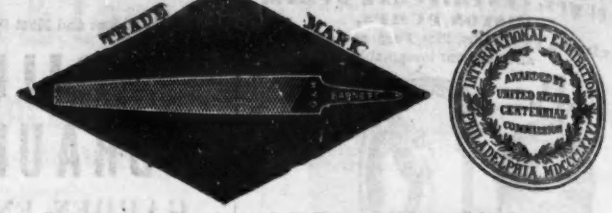
MINERS' CANDLES,

superior to any other Light for Mining Purposes. Manufactured by

JAMES BOYD'S SON,

Nos. 10 & 12 Franklin St., New York.

Black Diamond File Works.



Awarded by Jurors of Centennial Exposition, 1876, for "VERY SUPERIOR GOODS."

G. & H. BARNETT,

39, 41 & 43 Richmond St., Philadelphia.

CHARLES B. PAUL,

Manufacturer of HAND CUT FILES.

Warranted CAST STEEL. 187 Tenth Street, Williamsburgh, New York.

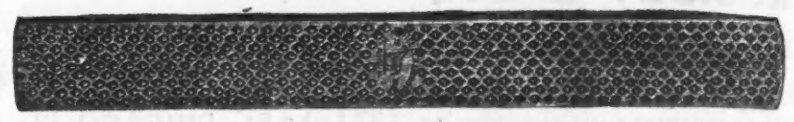
All descriptions of Files made to order. Price List mailed on application. Established 1863.

HELLER & BROS.,

MANUFACTURERS OF CELEBRATED

AMERICAN HORSE RASPS AND FILES,

NEWARK, N. J.



In view of the many so-called improvements and ingenious arrangements of the teeth of Horse Rasps made within the last few years, we take occasion to recommend our own Horse Rasps, made of the best American Steel, all **hand cut** in the **old style** by the most skilled mechanics; and we guarantee them to be unequaled in the market, as is best evinced by the unanimous verdict of all the skilled horseshoers who are using them for the last fifteen years all through the United States.

For sale by the leading Hardware and Iron Dealers in the United States and Canada.

EXCELSIOR FILE WORKS.

G. F. STOTT, Proprietor,

Rochester, N. Y.

JOHN H. SCHAAL,

Manufacturer of HAND-CUT FILES Exclusively.

Nos. 1 and 3 Second St., Baltimore, Md.

Warranted superior Cast Steel. Highest Medal received at Maryland Institute Exhibition in 1878. Send for price list. Files recut equal to new.

AUSABLE HORSE NAILS

POLISHED OR BLUED.

HAMMERED AND FINISHED

The Ausable Nails

Are Hammered Hot,

And the Finishing and Pointing are Done Cold,

Thus Imitating the Process of Making Nails by Hand.

Quality is **Fully Guaranteed.**

For Sale by all Leading Iron and Hardware Houses

ABRAHAM BUSSING, Secretary,

4 Warren Street, New York

New Patents.

We take the following abstract of new patents, recently issued, from the official record:

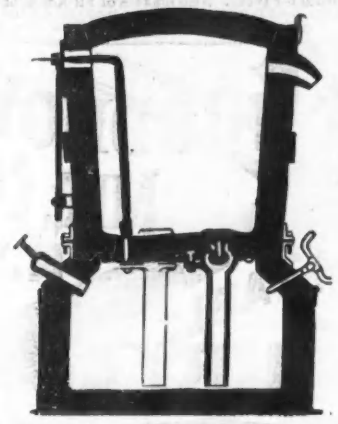
FIRE-BRICK FOR ANNEALING FURNACE.

To C. H. Morgan, Worcester, Mass.—Oct. 1.—A fire-brick for annealing furnaces, pro-

vided with longitudinal holes for the passage of the wire to be annealed, substantially as shown.

FREEING MOLTEN IRON FROM PHOSPHORUS.

To H. Schulze-Berge and J. Barnstorf, Oberhausen, Prussia.—Oct. 1.—Melts the iron in a closed vessel, into which some hydrocarbons have been introduced, so as to keep up a reducing atmosphere in the vessel. Fused chloride of calcium is then forced up through the molten iron, forming



phosphuret of calcium, which is prevented from oxidizing by the reducing atmosphere, so that subsequent reduction of the phosphites, &c., by the molten carburized iron and reabsorption thereby is prevented.

The within-described process of freeing iron or steel from phosphorus and other impurities by introducing into the iron or steel, while in a fluid state, and while excluded from oxidizing agents, chloride of calcium or other haloid salts of an alkaline earthy nature.

PITMAN JOINT.

To John Conley, St. Joseph, Mich.—Oct. 1.—1. In combination with the block E, the channel e^3 and screw e^2.

2. In combination with the pitman A and

journal c, the block E, channel e^3 and screw e^2.

ANNEALING FURNACE.

To Wm. S. McKenna, Pittsburgh, Pa.—Oct. 22.—1. The combination, with the combustion chamber, of the journaled bars, set in a suitable frame, and the worm shaft for revolving the bars.

2. The combination of the revolving bars and the frame having the pivoted section, wherein the bars are journaled at one end.

3. In an annealing furnace having a retort inclosed by tortuous flues, the combustion chamber having a suitable grate, in combination with the hollow perforated fire bridge and the feed shute, the feed shute being arranged opposite the face of the fire bridge.

4. The combination, with the annealing retort, inclosed by tortuous flues, of the combustion chamber and its grate, the hollow perforated fire bridge, the air-induction flue and flue of the combustion chamber provided with the supplemental bridge or cross wall, forming the dust chamber.

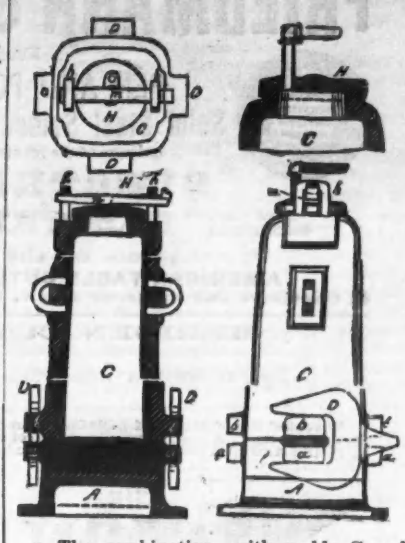
5. The combination, with the retort of an annealing furnace, of a series of tortuous flues, C, formed by pendent walls c^2, and verticals c^3 and F, formed by cross walls f^1, said flues extending longitudinally and transversely of the retort and connected by ports, whereby the products of combustion are caused to traverse back and forth and envelop the retort.

6. The combination, with the combustion flue of an annealing furnace, of an inclined hearth, interposed between the combustion chamber and annealing retort or retorts.

7. The combination, with the retort door of an annealing furnace, of a telegraph or curved elevated rail, B^1, secured to said furnace, and a suspension link.

INGOT MOLD.

To Wm. R. Jones, Braddock's, Pa.—Oct. 1.—1. The combination of the valve-faced cap H, mold A, having opening in its top, and corresponding valve seat, bails h and weighing bar m, said wedge bar bearing upon the cap at or about its center.



2. The combination, with molds C and bails h, of the removable pouring cup I, having bail guards i.

3. The combinations of mold C, having lugs b, a removable bed having lugs a, and the bifurcated clamps D.

The following trade-marks were recently patented in the United States Patent Office:

6567—*Cast-Steel Bars, Plates, Rods and Wire*—Francis Hobson & Son, Sheffield, England.—Sept. 10.

"The arbitrarily selected combination of word and letters 'Choice XX,' and the letters 'F. H.,' surrounded by an oval figure."

6586.—*Car Spring.*—Miller, Metcalf & Parkin, Pittsburgh, Pa.—Sept. 17.

"The arbitrary word 'Crescent.'"

6605.—*Steam Pump.*—Pulsometer Steam Pump Company, New York, N. Y.—Sept. 24.

"The word-symbol 'Pulsometer.'"

6636.—*Weighing Scale.*—E. & T. Fairbanks & Co., St. Johnsbury, Vt.—Oct. 1.

"The representation of a globe or sphere on which meridians and parallels are delineated."

The following designs were also patented:

10,824.—*Gas-making Stove.*—Charles R. Vaillant, Mobile, Ala., assignor to Gulf City Foundry Company, same place.—Sept. 10.—Term of patent 7 years.

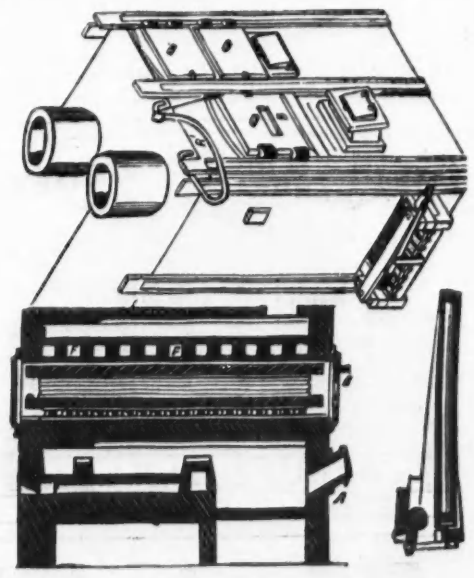
10,843.—*Padlock.*—Henry R. Towne and Warren H. Taylor, Stamford, Conn., assignors to the Yale Lock Manufacturing Company, same place.—Sept. 24.—Term of patent 14 years.

10,857 and 10,858.—*Clock Front.*—Henry R. Frisbie, Bridgeport, assignor to E. N. Welch Manufacturing Company, Forestville, Conn.—Oct. 1.—Term of patents 7 years.

10,877.—*Padlock.*—John Gerard, Trenton, N. J., assignor to the Trenton Lock and Hardware Company, same place.—Oct. 22.—Term of patent 14 years.

10,878.—*Spoon and Fork Handle.*—Gurden W. Hull, Wallingford, Conn., assignor to Simpson, Hall, Miller & Co., same place.—Oct. 22.—Term of patent 7 years.

Heating Passenger Railway Cars.—The Philadelphia *Ledger* says: The experiment of heating car No. 91 of the Walnut street branch of the Germantown and Southwark (Fourth and Eighth streets) line, by



means of a small coal furnace placed under the bottom of the car, has been so successful that it is intended to equip twenty cars of the Walnut street branch with this apparatus. The heat is conducted from the furnace, which consists simply of an iron box, placed between the front and rear wheels, with the door at one side of the car, through a pipe under the seats and on a level with the floor, the smoke and gas from the coal escaping above the roof in the front part of the car. A couple of pounds of coal is sufficient to keep the car dry and comfortably heated during the round trip. The new mode of heating, which is the result of a number of experiments, is said to possess so many advantages that its general introduction in winter on other passenger railway lines may be confidently expected.

A meeting of miners was held near Elizabeth, Pa., on Saturday last. The meeting was a secret one, and none of the proceedings have been developed.

Cutlery.

FRIEDMANN & LAUTERJUNG,

Manufacturers of

PEN AND POCKET CUTLERY,

Solid Steel Scissors, Shears, Razors, &c.

Sole proprietors of the renowned full concave patent

"ELECTRIC RAZORS,"

And the celebrated **"ELECTRIC SHEARS."** Nickel Plated Bows.

Agents for the BENGAL RAZORS.

AMERICAN TABLE CUTLERY, BUTCHER KNIVES, &c.

91 Chambers and 73 Reade Sts., N. Y. 423 N. Fifth St., ST. LOUIS, MO.

MERIDEN CUTLERY COMPANY.

The oldest manufacturers of Table Cutlery in America. Exclusive makers of the CELLULOID HANDLE for Table Cutlery. A most beautiful and perfect substitute for Ivory. Also makers of all kinds of TABLE, BUTCHER AND HUNTING KNIVES. Illustrated catalogues with prices sent to the trade on application.

No. 49 Chambers Street, New York.

THE LAMSON & GOODNOW MFG. CO.

88 CHAMBERS ST. N.Y.

AARON BURKINSHAW,

Manufacturer of **Pen and Pocket Cutlery,** Pepperell, Mass. Established 1853.

My Blades are forged by hand from the best Cast Steel, and warranted. To me was awarded the Gold Medal of the Conn. State Agricultural Society.

Office in New York with **E. P. Whipple,** 100 Chambers St.

NAUGATUCK CUTLERY CO.,

Manufacturers of FINE PEN & POCKET CUTLERY.

FULLER BROS., Sole Agents, 89 Chambers and 71 Reade Sts., N. Y.

Cutlery.

McCoy & Co.,

134 & 136 Duane Street, New York,

SOLE WHOLESALE AGENTS

CLARK'S

PATENT HORSE CLIPPER

Five styles. Fully described by our circular and price list, which we will send on application.

The genuine are stamped on both the wooden and metal parts, as shown in the illustration, as a protection against inferior imitations.

All repairs executed with care and dispatch.

Silver Medal, 1878—Paris.

J. R. SPENCER & SON,

Albion Steel Works, Sheffield,

MANUFACTURERS OF

FILES

AND

STEEL,

Table Knives, Razors, Shovels, &c., &c., of every description.

CORPORATE MARK.

N SPENCER SHEFFIELD

Granted 1749.

Cutlery.

JOSEPH S. FISHER,

No. 411 Commerce St., PHILADELPHIA

AGENT FOR

George Wostenholm & Son,

"Limited."

Washington Works, SHEFFIELD,

Celebrated I-XL Cutlery, Razors, &c

AGENT FOR

WALTER SPENCER & CO.,

Steel and File Manufacturers,

Rotherham, ENGLAND.

Corporate Mark.

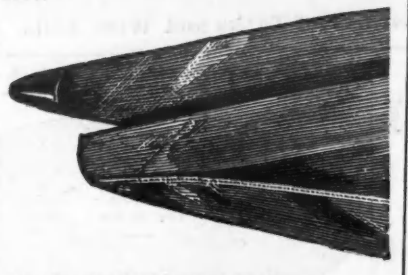
NO SPENCER ROTHERHAM

Granted 1777.

Isaac Greaves' Best Cast Steel

SHEEP SHEARS.

Equal to any in quality and finish, and lower in price. Same numbers, styles and list as Wilkinson's.



We also attach to these Shears the

PATENT GUARD POINT,

of which we have exclusive control. This is a great improvement. It effectually prevents sticking and cutting the sheep, and enables the operator to shear faster and smoother.

ALFRED FIELD & CO.,

93 Chambers Street,

Sole Agents. NEW YORK.

ALFRED H. HILDICK,

12 Warren St., N. Y.,

Importer of **CHAINS, ANVILS, VISES, &c.**

Agency of

HILL BROTHERS & CO., WALSALL, ENGLAND

GENERAL HARDWARE MERCHANTS,

And of

BALL'S PAT. SOLID STEEL SHEEP SHEARS.

These shears are unsurpassed for cheapness, durability and utility. They are made of one solid piece of steel from point to point, and cannot be broken in use either in the bow or at the junction of the shank and blade. Samples can be seen at above address, or sample lots furnished.

CORPORATE MARK,

Joseph Rodgers & Sons'

(LIMITED)

CELEBRATED CUTLERY,

No. 82 Chambers Street, New York.

F. & W. CLATWORTHY, Agents.

The demand for **Joseph Rodgers & Sons'** productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam power.

To distinguish Articles of **Joseph Rodgers & Sons'** Manufacture, please to see that they bear their Corporate Mark.

Young's Patent Folding Scissors.

Having largely increased our facilities for the manufacture of these very popular goods, we offer them to the trade at a large reduction from our former prices. The list price of the large size is now $12.00 per dozen, formerly $18.00, and the small size, $9.00, formerly $12.00. The material used in the manufacture of **Young's Patent Folding Scissors** is the very best. All are nickel-plated and furnished with a neat morocco case.

MARX BROS., Proprietors,

430 Broadway, New York.

P. O. Box 3962.

ESTABLISHED 1836.

Alfred Field & Co.,

COMMISSION MERCHANTS,

New York, Birmingham, Sheffield, Liverpool.

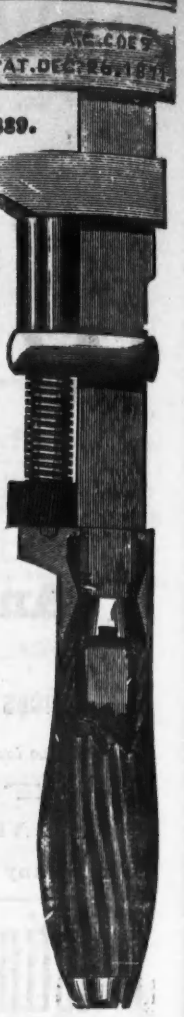
Guns and Pocket Cutlery,

SPECIALTIES.

Headquarters for

ELEYS BROS.' GOODS, WRIGHT'S ANVILS,
WILSON'S BUTCHER KNIVES, &c.
WOSTENHOLM'S POCKET CUTLERY AND RAZORS.
BUTCHER'S FILES, TOOLS AND RAZORS,
STUBS' FILES, HISCOX FILES,
GREAVES' SHEEP SHEARS,
CHESTERMAN'S TAPES,
GERMAN COIL AND HALTERS and other CHAINS,
BRADES' TROWELS AND HOES,
CANASTOTA KNIFE CO.'S POCKET KNIVES.
Etc., Etc., Etc., Etc.

All sorts of Hardware and Merchandise for import and export purchased on commission.



Established in 1839.

A. G. COES & CO.

WORCESTER, MASS.,

Successors to

L. & A. G. Coes,

Manufacturers of

THE GENUINE

COES

Screw Wrenches.

PATENTED,

May 9, 1871.
December 26, 1871.
December 28, 1875.
August 1, 1876.

The back strain when the wrench is used is borne by the bar—not by the handle.

The strongest Wrench made, and the only successful Re-enforced Bar.

None genuine unless stamped

A. G. COES & CO.,

Our Agents, GRAHAM & HAINES, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at factory prices.

MOHAWK & HUDSON MFG. CO., Waterford, N. Y. (four miles from Troy).

Eddy Valves.

FIRE HYDRANTS.

Yard Hydrants, Street Washers.

DODGE HAY PRESS.

"DRAW-UP" PRESSES,

For Domestic use, Drugs, &c.

LARD & TALLOW PRESSES.

See *The Iron Age* of July 4, 1878.

Axe, Hatchet, Powder and Brush Machinery.

IRON AND BRASS CASTINGS.

Pulleys and Shafting.

Patent Portable Hoisting Machines

PRICE LIST.

To Lift	To Raise.	Price.	Ex. Ft.
8 ft.	500 lb.	$22 50	$1 00
8	1,000	25 00	1 20
8	2,000	30 00	1 50
8	3,000	40 00	1 75
9	4,000	60 00	2 00
10	6,000	75 00	2 20
10	8,000	95 00	2 40
12	12,000	150 00	3 75
12	16,000	225 00	4 75
12	20,000	300 00	6 00

EDWIN HARRINGTON & SON,

Also Manufacturers of Machinists' Tools.

15th St. and Pennsylvania Ave., PHILADELPHIA.

NATIONAL STEAM PUMP.

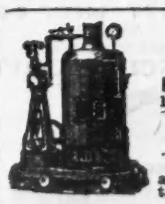
Adapted to every possible Duty.

Send for Illustrated Catalogue.

WM. E. KELLY,

New Brunswick, N. J.

New York Salesroom, 25 Murray St.



B. W. PAYNE & SONS,

Corning N. Y.,

Established in 1840.

Eureka Safety Power.

h.p.	cyl.	ht.	space.	wt.	price.
2	3½	48 in	40X25	900	$150
4	4X6	56 "	46X30	1600	250
6	5X7	72 "	72X42	2700	400

Also, Spark Arresting Portable and Stationary Engines for Plantations. Send for Circulars.

R. COOK & SONS,

Manufacturers of

Carriage & Wagon AXLES.

WINSTED, CONN.

ESTABLISHED 1839

W. & J. TIEBOUT,

Manufacturers of

Brass, Galvanized & Ship Chandlery Hardware,

No. 290 Pearl Street, New York.

HALL, ELTON & CO.,

Electro Plated Ware, German Silver and Britannia Spoons.

THE "REGENT."

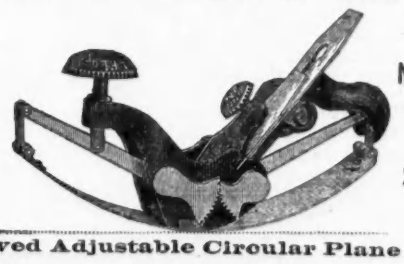
(Patented.)

Factories, Wallingford, Conn. Salesroom, 75 Chambers Street, New York.

STANLEY RULE AND LEVEL CO.,

MANUFACTURERS OF

Improved Carpenters' Tools.



FACTORIES,

New Britain, Conn.

WAREROOMS,

29 Chambers St., New York.

No. 113, Improved Adjustable Circular Plane - - $4.00

WONDERFUL PUNCHING.

D. L. KENNEDY'S

Spiral Shearing Punch.

THE

DRILL

AND REVOLVING CUTTER

SUPERSEDED,

AND THE WORK

2½ TONS PER SQUARE INCH

STRONGER than with the FLAT PUNCH.

Can be used in any Punching Machine, by license from the patentee,

D. L. KENNEDY,

10 Cortlandt St., New York.

CAUTION.—Infringements will be rigorously prosecuted.

EVERY HARDWARE DEALER

Should handle the

NEW BUCKEYE SCROLL SAW,

and send at once for our circular and special discount. The Buckeye is the cheapest, strongest and most desirable saw in the market. Address

A. E. FOLGER & CO.,

Springfield, Ohio.

Sold by the hardware trade.

"DRAW CUT"

BUTCHERS' MACHINES.

Choppers, Hand and Power.

Stuffers,

Lard Presses.

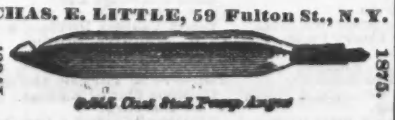
Warranted thoroughly made and the Best in Use.

MURRAY IRON WORKS,

Burlington, Iowa.

CHAS. E. LITTLE, 59 Fulton St., N. Y.

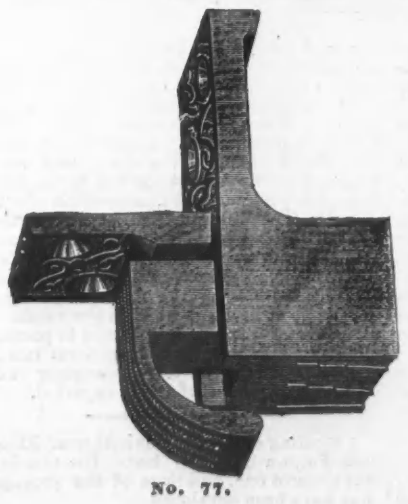
1760. 1875.



Solid Cast Steel Pump Auger.

Solid Cast Steel Augers & Reamers

For Boring PUMP LOGS. All sizes in stock Socket Shanks, Ring Handles, and Connecting Rods for the above to order. Also Tenoning Tools for joining log ends. Coopers' and Slaters' Tools, Tool Chests. Tools for all trades a specialty.



No. 77.

Door-Jamb Bolts.

These are a decided improvement over either mortise or surface bolts. They are much stronger, quicker handled, more compact, and are not affected by the door settling or warping.

The projection from Bolt with its anchor is let into the face of the jamb, secured by heavy screws, and the square frame of the bolt is let into the edge of the casing. The small plate is put upon the face of the door, and the bolt is pushed out over it.

If by accident the bolt is pushed out when the door is open, it will be thrown back by the door in closing.

Send for catalogue to

PAYSON & CO.,

MANUFACTURERS OF

Builders' Hardware,

1319 to 1325 West Jackson St.,

CHICAGO.

American Stoves for Foreign Markets.

Extracts from Letters of U. S. Consuls and Commercial Agents.

GERMANY.

Freight, per 100 cubic feet, New York to Hamburg, $19.20; to Bremen, $21.60.

Barmen.—Mr. Edgar Stanton writes: American stoves are virtually unknown in this district—*i. e.*, Rhenish Prussia and Westphalia. I do not remember ever having seen either an American cooking or heating stove in use in this country. The stoves most in use are the so-called "Sprung" and "Tafel-heerd" for cooking, and the "Mardel" oven for heating purposes. The former, "Sprung-heerd," gets its name from a longitudinal fissure in the top to prevent splitting by expansion. In shape this stove is something like the common American cooking stove, and costs in medium size about $45 or $55. The "Tafel-heerd" is a square range, and is never built in the chimney-place. It costs from $50 to $65. These stoves, which are by no means equal to a good American cooking stove, are in very general use. They are economical in the matter of fuel. It is customary in Germany to extinguish the kitchen fire after each meal has been cooked. For heating purposes the "Mardel" oven is almost universally employed. This stove consists of an upright iron cylinder incased in a perforated frame of cast iron, with a marble slab for a top. The stove heats well, but is regulated with difficulty, and throws off a very dry, oppressive heat. According to the style of finish, these stoves cost from $10 to $100. In this district, which differs from other parts of Germany in this respect, the houses are never furnished with either cooking or heating apparatus. The fuel in general use is a soft bituminous coal, not especially rich in gas, and costing, the "Scheffel," or 100 lbs. English, from 17 to 24 cents. The duty on iron and steel casting is 29 cents, gold, per cwt. Unless the difference be excessive, I do not think that with a superiority in other qualities the higher price would militate against American stoves. If the attempt be rationally and persistently made I believe a great trade could be done in American stoves. Acknowledging the great superiority of almost all kinds of American manufactures, I find that they have the following obstacles to contend with:

1. Despite their many excellencies, they are generally much dearer than the articles in common use which it is desired to supplant.

2. The Germans, as a nation, are poor, very close buyers, and accustomed to receive credit ranging from nine to twelve months.

3. That the Germans are of a very conservative character, and receive novelties with distrust and suspicion, a feeling in many cases justified by the great deterioration of articles of American manufacture which have been introduced into the German market, and by the frequent imitation of American articles.

4. That most German merchants who have attempted the introduction of American wares have lost money, and are not disposed to renew the experiment.

5. That in many of the articles which it is sought to introduce, too little regard has been paid to the wants and requirements of the German people, but that the American standard has been taken as a gauge for all other nations.

Now, although these difficulties in the way of an export trade are by no means insuperable, they are not to be overcome without a monetary sacrifice, and the exercise of considerable patience. To develop a trade in Germany three things are, in my opinion, absolutely essential: The goods must be adapted to the taste and requirements of the German people. The habits and tastes of the two nations are very different; what are for the American necessities are often luxuries for the German. An article which in the United States is a perfect success, is in Germany an utter failure. The Americanization of Germany is altogether too expensive an idea, and should not be entertained, while the disregard of the requirements of German tastes is sure to entail pecuniary loss. The vast majority of the people are poor, and they are not accustomed to purchase trifles or luxuries, and to gain their trade the article it is desired to sell must answer all the requirements of their household economy. The American manufacturer desiring a European trade must conform to the manners and customs of conducting business in that country. People can obtain long credits with facility, and as they possess but limited means, and are wedded to their time-worn ways, it is folly to expect them to take either kindly or quickly to any new system which foreigners seek to introduce. The establishment of some general depot is the last essential. I consider this desirable, because of the very different business division in this country from that in America, from the fact that the wholesale trade is averse to making experiments to their own detriment in the interests of the American manufacturer, and the retail is pecuniarily incapable. The plan of a Continental depot is also to be recommended, since it is then more easy to furnish proofs of origin, and thus cripple the competition of cheap counterfeits. Again, from such a central depot small dealers could be kept better supplied, sub-agencies easier established, since the, in itself, difficult introduction of a new trade would not be hampered by the trouble and expense attendant on direct importation. The manager of such a central depot would soon familiarize himself with the manner of conducting business, and becoming also cognizant of the taste and requirements of the people, would be in a short time in a position to push business in a way an individual consignee never would. I have spoken with many merchants here, and find them averse to assume the risks of an experiment. The wholesale merchants deal largely in a few specialties, and are generally lacking in enthusiasm, while the retail dealer is altogether too petty and unimportant to be able to do much toward introducing a new article, even when animated by the best intentions. I am firmly convinced that all firms desiring to do a large trade in this country must, in the beginning, at least, assume the risk and trouble of putting the goods on German soil. I think you might with advantage open correspondence with Messrs. Jacob Bünger Sohn, of Barmen, and Messrs. Peter Ludwig Sohmidt, of Elberfeld, and, perhaps, Wm. Walscheid, of Solingen.

In conclusion, I give you the addresses of some of the important stove manufacturers of this province, viz.: Messrs. Potthof & Flume, Trinen-on-the-Lippe, near Dortmund; the Lauchhammer Hütte, Lauchhammer; Messrs. Meyer & Co., Norden, Ostfriesland.

Berlin.—From Mr. H. Kreissman: No American stoves, to my knowledge, have been or are used in this city. The stoves used for dwelling-room purposes here are mostly manufactured of clay designated "chamotte," and constitute permanent fixtures of the house. Only in exceptional cases and in the poorest kinds of tenement houses, cheap portable iron stoves are in use. In large public halls, places of amusement, restaurants, &c., stoves similar to those used for like purposes in the United States are used in the winter, and it might be that an opportunity might offer here for the introduction of stoves of American make. It is becoming more and more the custom to make the cooking apparatus permanent fixtures. As to general heating apparatus they are but little introduced as yet. For heating dwelling-rooms peat is very commonly used here, also "brown" (vegetable) coal, and to a considerable extent, also, bituminous (stone) coal. Wood is used chiefly for kindling purposes. On iron stoves and furnaces there is a duty of 60 cents per cwt. There would be considerable difficulty in inducing the class of people who avail themselves of iron stoves to purchase them at a higher rate than that at which like stoves of German make can be bought, as it would take some time to make them understand the advantage of doing so. Upon present advices there does not seem much prospect for the introduction here of American stoves. Perhaps Messrs. Jacob Ravené Sons, the largest dealers in ironwares in this city (No. 92 Wall Strasse), would, if addressed, take an interest in the matter, and if so, they, better than any other firm, would accomplish your purpose. The firm of M. Hamburger, No. 55 Oranienburgerstrasse, and of Hugo Wolheim, Kaiserhosser, in this city, are also suitable parties to be referred to.

Brunswick.—From Mr. Williams C. Fox: There are, to my personal knowledge, three cook stoves or ranges of American manufacture now in use in Brunswick. These are in possession of American citizens, who especially imported them for their own use. The principal stove manufacturers are at Carolshütte, Rübeland, Tanne and Wilhelmshütte, near Seesen; these are all in the Duchy of Brunswick. In the province of Hanover are Rothehütte, near Elbingerode, Julius Meyer & Co., in Norden, and Dirks & Jo. in Leer. Regulators are principally manufactured and are in demand. The fuel generally used is the stone or pit coal, coming from Silesia and Westphalia, also coke and turf (or peat); this latter substance is not used to such an extent as in former years. The duty on imported stoves is from 1 mark to 1 mark 20d. per 100 lbs. The Germans are, as a rule, careful buyers. My experience has been that the cheapness of an article is the first thing to attract them to it; therefore, were it demonstrated that the extra cost could be saved in fuel, I think there would be no difficulty in finding a market here. The possibility of creating a permanent demand for American stoves depends entirely upon the following circumstances, viz.: Durability, convenience, and general appearance, and above all there must be no difficulty with the fuel. I am convinced that no one here would purchase a stove from America and "trust to luck." I would, therefore, suggest that either consignments be made to one or more reliable dealers, or full and explicit drawings and descriptions, together with cost, including freight to Hamburg or Bremen, be sent. I will be most happy to furnish parties with names and addresses of such dealers, when desired.

Hamburg.—Mr. John M. Wilson, Consul at this city, handed Mr. Sard's letter to Mr. V. E. Wittmann. We extract the following passages from this gentleman's answer:

It is my belief that a lively and extensive trade can be done in Germany and Austria in American stoves and ranges, as those in use are old-fashioned and clumsy, and consume, to my best belief, more coal than the American ones. I was, during many years, in the States, and know this article pretty well, and don't hesitate to say that there is a large business to be done here, if properly attended to. American stoves have never yet been properly introduced in the German market. Stoves used in Germany are mostly manufactured in this country or France, and are made for parlor and bed-room stoves out of half iron and half white bricks. The cooking and heating apparatus is used not only in each dwelling, but by every family, so that a four or five story house has at least as many cooking ranges. Coal is the general fuel. The price of American stoves can be slightly higher than those manufactured in Europe, provided it can be proved that your stoves consume less fuel, and are more durable than the old-fashioned ones. I am sure that if the American stoves can compete with the German and French ones in price, only a short time will be required for them to obtain control of the market, if properly pushed at first. Mr. Wittmann concludes by offering his services as agent for American stove manufacturers, and refers to: Messrs. Slack, Sellars & Co., Sheffield; Messrs. Regenburg & Co., alte Gröninger street, 4 Hamburg; Mr. G. Baumgarten, Zollenbrücke, 1 Hamburg.

(To be continued.)

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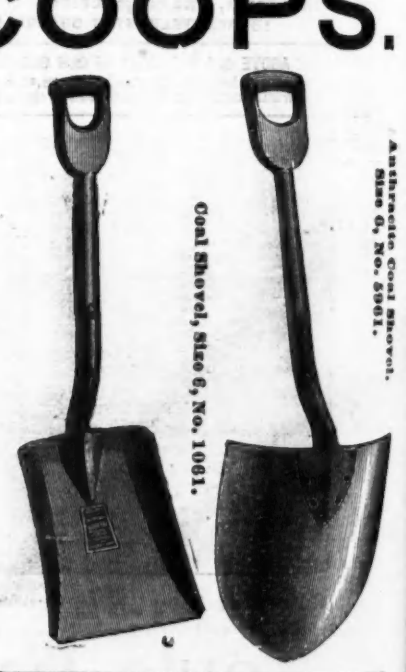

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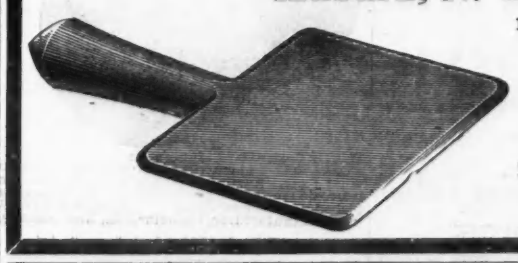

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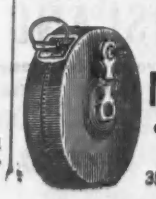

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Art Castings in Iron.

The Magee Furnace Company, Boston, Massachusetts, have furnished another illustration of their ability to make art reproductions in cast iron. Their latest product in this line is a reproduction of a large repoussé shield by Benvenuto Cellini, the famous artist in metals of the sixteenth century. The shield is about 24 x 30 inches in its superficial dimensions. The center is a design in high relief, representing the dragging of the wooden horse into Troy, the remarkable skill of the artist being shown in the manner in which he has given the effect of perspective without the aid of color. The border, 5 inches wide, is ornamented with four designs, representing scenes from the Iliad, connected by trophies of classic arms.

The success which has attended the reproduction of this choice work of art suggests many possibilities. The writer of this article, in a paper read before the National Association of Stove Manufacturers, at Rochester, spoke unfavorably of reproductions of repoussé work in cast iron. These comments were fully warranted by the results which have attended most attempts to adapt repoussé designs to the ornamentation of stove plates, and are always true as applied to copies in a black metal of designs originally made in, and exclusively adapted to a light-colored metal, like silver, gold or yellow bronze. But there are castings and castings. In most of those made as art reproductions by the Magee Furnace Company, we have a very different kind of work from the reproductions used as stove ornaments. So far as we can discover, the Cellini shield has lost nothing by its reproduction in iron. As a casting, however, it is not a work of art, but it may be made so by plating with silver, gold, brass, or brown bronze, which would give the proper color and practically reproduce the original. The excellence of the effects secured by galvano-deposition upon cast iron were illustrated by the examples in two colors—brass and bronze—shown at the Rochester meeting. The writer also has some beautiful examples in oxidized silver, and the deep olive green of old bronze relieved with *verde antique*. These examples show that cast iron is a material in which, with the aid of the galvano-plastic art, we can make cheap and excellent reproductions of anything which can be molded in sand. Hitherto we have been dependent for such reproductions upon the costly process of electrotyping in copper or silver, and filling the sheet thus made with a fusible alloy. This process, wrought to its highest perfection by the Elkingtons, is unquestionably the most perfect of all methods of art reproduction, and can deal successfully with a class of work which cannot be molded in sand; but the Magee Furnace Company have shown, by many examples, that cast iron is available for use in a large class of work, and that it places good reproductions within the reach of people who cannot afford the costly Elkington electros. We congratulate them upon their success, and hope that, with what appears to be their exceptional facilities for making fine and dense castings, they will make the manufacture of a line of original art castings a feature of their business.

Failure of the Cherry Valley Iron Company.—The Cherry Valley Iron Company, of Leetonia, Ohio, has made an assignment for the benefit of its bonded creditors—to F. H. Zeperrieck and S. J. Firestone, of New Lisbon, Ohio; John McClymonds and E. R. Perking, of Cleveland, Ohio; John A. Caughney, of Pittsburgh, and C. A. Schmick, of Leetonia, Ohio. The company was organized in November, 1873, under the corporate laws of Ohio, succeeding the Leetonia Iron and Coal Company, who assigned about one year previous, they taking the property and assuming the indebtedness, amounting to about $800,000, and agreeing to pay the same within a period of ten years, with interest after three years. They make the following statement of their affairs: They have no indebtedness (excepting what is secured) other than the bonded indebtedness for the original purchase of the property. They have also made the following payments since they took the property: Stone mortgage, $35,000; interest on same, $3,318.12; Wade claim, $14,250; first mortgage bonds reduced, $30,000; interest on same, $49,393.62; second mortgage bonds reduced, $113,025.98; insurance and taxes, $20,500.50; permanent improvements on furnace and rolling mill, $30,000; permanent improvements on coal banks, coke ovens, &c., $25,000. The real estate remains as taken, with the exception of a few lots sold, the proceeds of which were paid over to the trustees. They have labored hard to make it a success, but owing to the general depression of real estate, furnace and rolling mill property, with the depreciated condition of the iron trade, and petty annoyances from some of the smaller bonded creditors, has made it impossible to pay off the indebtedness as contemplated. In view of these facts, and in justice to the holders of the second mortgage bonds, they deemed it advisable to take the course they have.

The Camden *Post* says that Camden and Philadelphia will soon be connected by a telephone line. Fourteen large corporations doing business in the two cities, in which are included some of the Camden banks, are interested in it and have subscribed to the stock. Two other large manufacturing firms are negotiating for admittance into the company, but have not, as yet, completed arrangements. It is proposed to commence the construction of the telephone lines immediately upon the acquisition of a membership of fifteen.

The Lehigh Valley Railroad has 235 engines and 25,454 cars, including all classes. During last year 66 coal cars and 150 house cars were built at Packerton, and one engine in the Easton shops. The general freight traffic in 1878 was 27.71 per cent. greater than in 1877. The receipts from passengers, express and mail were $37,655.52 less than the previous year. The corporation has 639.36 miles of track.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, February 27, 1879.

DAVID WILLIAMS . . *Publisher and Proprietor.*
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CONTENTS.

The Baltimore meeting of the American Institute of Mining Engineers, of which a report is printed elsewhere in this issue, was a great success. The attendance was unusually large, the papers many and valuable, the discussion able, and even brilliant, and the interest sustained throughout. The only drawback to the enjoyment of those who attended the meeting, was the apparent inhospitality of the citizens of Baltimore. It was afterward explained that this was due to a series of accidents; but no explanation can efface the impression that, in this instance at least, the people of Baltimore failed to sustain their reputation for hospitality. That so important an association, largely composed of the representative men of a great and important industry, and including among its most active members gentlemen whose scientific attainments have won them world-wide reputations, should have remained nearly three days in open session in the Academy of Music of a city like Baltimore, and yet not one citizen attend its meetings who felt authorized to say that the Institute was welcome, is as surprising as it is disappointing. Fortunately, however, the Institute was not dependent upon public recognition, and all who attended the meeting will remember it with pleasure. Our Pittsburgh friends will have the honor of entertaining the Institute at its meeting in May next, and that they will make the meeting memorable may be counted as certain.

The Corporate System in the European Iron Trade.

Even to casual observers, a striking feature of the iron industry in this country, as well as in Europe, has been the undue proportion between the capacity of the works engaged in production and the demands of the market—or, in other words, the liability of the iron industry to suffer from overproduction. Naturally, this state of affairs has been the result of a variety of causes, which may, according to locality, have differed in the share which they have contributed toward a common end; but the fact that their effect has been universally felt, seems to show that they are general in character. The waste produced by great wars, the stimulating influence of enlarged and extended commerce and the colonization of vast countries, the improvement in plant and processes, may be named as some of the more prominent causes which contributed to the enlargement of existing works and the creation of new ones, between 1860 and 1870. Enterprise, founded, as it ought to be, upon a thorough knowledge of the affairs in which it is to engage, yielded to the wildest speculation. Even the Germans had their "Schwindelperiode" after the war. This serious feature, which has so much retarded revival, has been greatly favored by the corporate system. The tendency in the iron trade, as in other industries, has been toward the organization of joint stock companies in the prosperous days. Apparently successful establishmets were expanded, their working capital increased, their plant enlarged, and allied industries, such as coal or ore mining, added, with the object of controlling necessary supplies. Generally, it has been found that such vast enterprises were beyond the reach of individual resources, so that, naturally, the formation of a corporation was the result. By such an organization persons of limited means were enabled to seek the large profits confidently expected, because the only obstacle hampering individual efforts—insufficient capital—was removed. Provided with ample means, the new company would be able to equip an expensive and improved plant, which would rapidly pay for its cost by the saving effected in the reduced cost of the product. A large portion of the surplus funds could be invested in such a manner as to make the new concern independent of coal and ore mine owners, whose profits would be turned into the coffers of the joint stock company. All the general expenses of management, both commercial and technical, would be greatly reduced per ton of product.

Such are the familiar arguments which carried conviction to the minds of the most prudent. The experience of the last ten years has proven that there are some important points to be considered which, in the excitement of prosperity, are apt to be lost sight of. The one most disastrous in its consequences has been the high cost at which, in many cases, the works were acquired, the basis being generally the inflated prices of a period of great industrial activity. Large profits could only be expected while such times lasted; they shrank rapidly when circumstances were less favorable, and then many of the evils peculiar to the corporate system came out in strong relief. The private interests of directors and managers were found, in many cases, to be at variance with those of the stockholders they represented, and even with the best of intentions, it is usually impossible to secure in the management of a stock company unceasing, vigilant attention, and the concerted, harmonious action of individual enterprise. It has been shown of late too frequently how easily the administration of joint stock companies may become lax, that supervision is not as close and as exacting as it ought be, and that there is a disposition to shift the responsibility, in cases of emergency, which leads to rash action. These are the causes which have brought to grief many companies organized with good prospects of success. But it should not be forgotten that there have been many cases in which the joint-stock plan has been resorted to as a means of bolstering up firms on the downward road. Both classes of organizations, those rotten at the outstart and those strong financially, but weak in other points, have of late succumbed by the hundred in Europe. In England, many great stock companies have yielded to the pressure of circumstances with which they were unable to cope. In France and Belgium the losses have been enormous, and similar disasters have befallen German and Austrian companies. How many concerns are now hopelessly drifting into bankruptcy it is impossible to estimate, but it seems as if many joint stock companies must be wiped out. The sooner this occurs the better it will be for the trade. In their desperate efforts to keep afloat they have flooded the markets, selling at a loss often greater than those in control have realized. It will be an advantage to their shareholders, as well as their creditors, to know exactly the condition of their affairs.

It would not be fair to assume from such facts as these that the plan of corporate organization is less likely to be attended with success in iron making than in other industries. Such conclusions could probably be disproved by the many instances which might be cited showing how, with good management, the large capital of stock companies has been productive of great profit to stockholders through long terms of years; but it cannot be denied that the divided responsibility, the meddling interference of incompetent directors, the jealousies, rivalries and conspiracies among salaried officers, the indifference to minor economies which can only be secured by a vigilance that employees rarely feel called upon to exercise, the danger that influential stockholders will saddle the works with the expense of maintaining too many "walking gentlemen," the liability to frequent change in the management of works and business—all these are dangers which menace the stock company far more than the individual or the firm who manage their own business and spend their own money. At the same time a well-managed company, with the controlling interest in good hands, occupies a position of advantage in proportion to its capital; and, with proper care on the part of stockholders that the officers render a true account of their stewardship at proper times, we do not know that the system is one which has less to commend it than to condemn it.

The Increasing Use of Coke in the Blast Furnace.

More pig iron is now manufactured in the United States with bituminous coal and coke, than with either anthracite coal or charcoal. Up to the year 1855 more pig iron was made with charcoal than with either anthracite or bituminous coal, but in that year anthracite took the lead, which it kept until 1875, when it was exceeded by bituminous fuel and coke, which now have the ascendency and promise to retain it. The production of pig iron with bituminous coal and coke was less than that made with charcoal until 1869, only ten years ago, when charcoal was left in the rear forever.

The first use of coke in the blast furnace in this country occurred, according to Mr. James M. Swank, in 1835, and the first use of raw bituminous coal for the same purpose took place in 1845. The progress of bituminous fuel was slow for many years, for even as late as 1854 only 8 per cent. of all the pig iron produced in the United States was made with it. In 1864 this proportion had increased to 19 per cent., and in 1869 to 21 per cent.; but in 1875 it jumped to 42 per cent.; in 1877 it reached 46 per cent., and in 1878 it was about 46 per cent.

For many years the locality was limited in which bituminous fuel was used in the manufacture of pig iron, being confined to Western Pennsylvania, Ohio and Maryland. With an increasing demand for iron, a growing scarcity of timber suitable for charcoal, the development of new bituminous coal fields, the increase of skill in the manufacture of coke, the attainment of a more perfect knowledge of the art of making pig iron with mineral fuel, and the extension of transportation facilities, the use of bituminous coal and coke extended beyond the limited area of its first employment, and blast furnaces in widely-separated States were built to use bituminous fuel. The States of Virginia, West Virginia, Georgia, Alabama, Kentucky, Tennessee, Indiana, Illinois, Michigan, Wisconsin and Missouri now have furnaces built to make pig iron with coke or bituminous coal, most of them using coke alone.

During the war and for a decade after its close, the high price of pig iron enabled many furnaces to run on coke which were located hundreds of miles from their fuel supply. In Michigan, Wisconsin and Missouri, pig iron was made at a profit with coke taken there from Pennsylvania—in some cases the coke being mixed with the more expensive anthracite coal. In many other localities raw bituminous coal was almost exclusively used in furnaces then in operation. In the Shenango Valley, the Mahoning Valley, the Brazil district of Indiana and the Big Muddy district of Illinois, coke was used very sparingly, if at all.

The steady fall in prices from the spring of 1873, which compelled the exercise of economy, had a remarkable effect upon the use of coke. While the pig iron made with anthracite coal, with raw bituminous coal and with charcoal diminished in quantity, that made with coke constantly increased. This was due to several causes. Coke sold at very low prices, closely competing with raw coal wherever the latter had to be transported any distance to the furnace; it was not liable to deterioration when a large stock was kept on hand; more iron could be made with a ton of it than with a ton of any other mineral fuel; being free from sulphur, it made a better iron than the raw coal, and a furnace could be driven faster with it, thus making a larger yield, and reducing cost by spreading general expenses over a larger product.

In 1875, owing to the great strike in the anthracite region, which cut off the supply of anthracite coal, many of the furnaces in the eastern part of the country were compelled to use coke, wholly or in part, for several months. Such satisfactory results followed the introduction of the new fuel into a part of the country from which it had seemed forever debarred by natural causes, that a considerable number of the Eastern furnaces which were compelled to use coke by necessity, continued its use from choice after the strike ended. It was generally used, however, mixed with a larger or smaller quantity of anthracite. In 1876 and 1877, the demand for coke by Eastern furnaces continued to some extent, and in 1878 it increased. Last year coke was used, mixed with anthracite coal, by furnaces in Northeastern and Eastern New York, in New Jersey, in Central Pennsylvania and in Maryland, the supply in every case coming from the famous Connellsville coke district. All the furnaces just referred to were built to use anthracite coal, and never used any coke prior to 1875. To reach some of these furnaces the coke had to traverse the entire length of the anthracite region. Quite a considerable quantity of the anthracite pig iron sold in Eastern markets in the past four years, has been made with an admixture of coke. This, however, cannot be regarded as an adulteration, as the pig iron made by the mixed fuel ranks equally high with that made with anthracite coal alone. In the furnaces using the mixed fuel the proportion of coke used varies very greatly, a few of them using two-thirds coke, but the greater number using only from one-tenth to one-fourth coke.

The extraordinarily large runs made by coke furnaces in Western Pennsylvania in 1874 and succeeding years, undoubtedly had an effect in attracting attention to this fuel. No other furnaces in the world of equal size, ever made as much pig iron in the same length of time as the Lucy and Isabella furnaces have made. Other furnaces in their vicinity are following closely in their footsteps, all of them using coke, while some Eastern furnaces which use a mixture of coke and anthracite, are far surpassing their own previous production when running on anthracite alone.

The production of coke pig iron must continue to increase rapidly. It is now manufactured in many States in which charcoal, not many years ago, held exclusive sway. Throughout the country the number of charcoal furnaces in blast grows smaller every year, while their aggregate production diminishes. Anthracite coal no longer goes West to furnaces in Michigan and Wisconsin. Many raw bituminous coal furnaces have changed to an admixture of coke, some of the furnaces in the newly-developed Hocking Valley using the mixed fuel. In Indiana, raw coal furnaces were first built in 1867, and such high hopes were entertained of the advantages of the block coal of that State, that other furnaces were built in succeeding years, and the production of pig iron attained 35,000 gross tons in 1872; but from that year it rapidly fell off until, in 1878, not a ton of pig iron was made there. In the Big Muddy district of Illinois, not a ton of pig iron has been made for several years. At Pittsburgh, on the other hand, more coke furnaces are now building. A number of the coke furnaces of Missouri and Wisconsin are again producing pig iron. In Kentucky and Tennessee, coke furnaces are increasing in number and production. East Tennessee will soon have another new furnace in blast, adding its hundreds of tons weekly to the quantity of coke pig iron made in the country.

It would be very interesting, if it were possible, to learn the exact quantity of pig iron now produced in the United States with coke. This will have to remain an unanswered question, owing to the manner in which coke is mixed, in many furnaces, with either anthracite or bituminous coal. It is, however, safe to say that much more pig iron is now produced by coke alone or by coke mixed with other fuels, than is made with either raw bituminous coal alone or anthracite coal alone, and the probabilities of the future are that the proportion will steadily increase.

The Cost of Transportation as Affecting Industrial Development.

In any contest we may have with other nations for the trade of the world, we shall always be heavily handicapped by our transportation charges. We have a magnificent country in extent and resources, but with these we have had to take the drawback of magnificent distances, in many cases, between the materials necessary to be brought together for certain manufactures. Pittsburgh, with its superior blast-furnace fuel, must go to Lake Superior or Missouri, a thousand miles, for its ores, while Lake Champlain and Missouri, with their rich and pure ores, must bring the fuel to smelt the same from Pittsburgh or the anthracite regions. This will become in some degree less burdensome in the future. New deposits of fuel will be discovered, or those already known will be further developed, and means found to utilize them, and similar results will follow regarding ore; but at the best we shall always find our transportation a heavy burden. Mr. Bell, in his notes on our coal and iron, saw this very clearly and commented upon it.

This is one point in which England has a decided advantage over us. Not only has she a sea, coast that furnishes the opportunity for the cheapest carriage of ores and fuels from one part of the kingdom to another, and even from foreign countries, but her system of canals is a marvel and a surprise. It is stated that at the time of the introduction of railroads into Great Britain, there was not a point in England over 16 miles from water communication. At this day the United Kingdom, with her network of railroads, and with an area less than the States of Ohio and Pennsylvania, has in active operation over 4000 miles of canal and river improvements, divided as follows:

	Miles.
Canals in England	2,600
" " Scotland	226
" " Ireland	275
Navigation	900
Total	4,001

In South Staffordshire, in the heart of England, most of the heavy raw material is brought to the works by canal, and when the product is heavy and used in the neighborhood, is taken away in the same manner. Ore and coal and limestone are taken to the furnaces and pig carried away to the mills, which also receive their ore, coal, Blue Billy, &c., in the same way. At Bolckow, Vaughan & Co.'s, at Middlesboro', Spanish ores are delivered at the wharfs alongside the furnace at a less cost for transportation than the Pittsburgh furnaces pay for Lake Superior ores. If it was not for this low rate of freight, it would be impossible to make Bessemer in the North of England to compete with the West Coast.

These facts furnish something of an indication as to the future locations of our successful mills and furnaces. In the past other considerations have determined this, and it is seen now that localities have been unfortunately chosen in many cases, and will have to be abandoned. In the West, as the rule, the successful mills and furnaces are located on the water-ways, the Ohio and the lakes. Johnstown and the Shenango and Mahoning valleys are seeming exceptions, but Johnstown has certain advantages which enables it to be a successful exception, and the Mahoning and Shenango valleys are so near the lakes that the exception in their case is more seeming than real. And yet in these valleys the pig iron interest is declining; the great majority of their furnaces are idle, while Pittsburgh has largely increased its capacity in this direction since the panic.

The West will also be forced, in view of any export trade it may acquire, to use these water-ways, especially the Ohio and Mississippi. For a while we may seek foreign markets through England and Germany, and allow these countries to be our merchants, but it will not be long. In the future we shall sell our own goods and ship them direct. The trade will be South and Southwest largely, and New Orleans must become a large distributing point for these goods. It will be cheaper for the Western manufacturer to ship to New Orleans than to New York or Philadelphia or Baltimore, especially heavy goods. Nails, for example, are often taken to New Orleans from Wheeling for 15 and 20 cents per keg. These points can ship East and forward from New York, but from below these points it is at present useless to seek any foreign markets for manufacturers, the cost of transportation being too great.

The Outlook for Lake Superior Ore.

One of the most important questions now under discussion in iron centers West, is the announced advance in the price of Lake Superior ores, and the probability of sustaining the same. Every one wishes that the condition of the iron market were such as would justify this advance, and render it possible to maintain it, but whether such conditions exist at present is a point on which ore men and furnace men differ.

We have already, in our issue of Jan. 23rd, given the reasons which led the Republic Co. to advance 50 cents. These were found in the increased cost of production incident to the change from an entire open-air mine to a partial underground mine, entailing an additional cost of 50 cents and reducing the output. They may have believed that there was such a condition of the market, especially in the prospective demand for pig iron for Bessemer and open-hearth, as would enable them to maintain the advance; but whether there was or not, they seem determined to hold out for the price and will probably get it. The company is able to mine as much or as little as they choose, and are not obliged to sell; but as they have already sold nearly one-third of their utmost product for the year, the probability is that the balance of this will be taken. Those mines which have not as good an ostensible reason to give for an advance as the Republic, claim to have a good reason in the state of the trade and the outlook. It is claimed that the demand for good ores for Bessemer and open-hearth purposes will be greater than ever. The prospective demand for all forms of iron in the West this year will be very much in excess of any previous year. There is less ore unsold on the docks now than at this time last year, though the shipments to lower lake ports last season were among the largest ever known.

The furnacemen, in opposition to this, grant that the demand for pig iron for Bessemer and open-hearth purposes will be very large this year, but assert that the amount of Lake Superior ores that will go into these will be less than heretofore, and also that some of the new developments in the Menominee iron region are so low in phosphorus that they can use inferior Marquette ores in making Bessemer, and get a mixture that will not cost any more than their last year's mixture, if as much. In proof of these positions, they point to the large purchases of Spanish ores by Eastern Bessemer works that have been using Lake Superior ores to

a considerable extent, either as ore as a mixture in the furnace, or as pig as a mixture in the converter. It is stated that Bethlehem, Harrisburg and Cambria have all bought Spanish ores. Bethlehem is reported to have bought the product of an African mine. Pittsburgh furnaces, notably the Lucy and the new Edgar Thomson furnace, which will be in blast some time this year, are negotiating for quite a quantity, from 50,000 to 100,000 tons. The amount purchased by Harrisburg is stated to be 35,000 tons, yielding 57 per cent. of iron absolutely free from phosphorus, and which costs less than $6 laid down at Harrisburg. This would be a fraction less than $7 for a 66 per cent. In other words, they get an amount of ore that will yield as much as a ton of Republic, at their furnaces, at the same price as the Republic charges on the docks at Cleveland; and the Spanish ore is, in reference to phosphorus, a much better ore. The freight from the lake is entirely saved. These foreign ores will form return cargoes for the vessels that are carrying grain to Spain, a contract having been signed, or about to be signed, for their entire capacity. It is also a fact that a certain Western furnace that last year bought 50,000 tons of Republic ore—thinking this ore essential to the manufacture of high-grade Bessemer pig—will not buy a pound this year, but has already bought nearly its season's supply of ore. Furnacemen also say that they do not see any reason in the condition of the market to justify an advance They concede that the demand will be very large, but do not see any reason for believing that it will be at much, if any, appreciation in price. Bar iron and nails are in a worse plight than they were three months ago, and there is little prospect of any better rates until fall, if then, though it is true that merchant mills are refusing to book orders for future delivery. It is conceded that there is an improvement in price East in pig iron, and it is claimed that there was a better opportunity for it than in the West, as pig, compared to the selling price of merchant iron, was much lower East.

With these different views, we confess ourselves unable to arrive at any conclusion. The action of the Eastern furnaces, and of certain Western furnaces, will have a tendency to weaken the price of Bessemer ores. Not only will the demand for ore in the East be much reduced, but the demand for pig iron will be less, and this will make a decreased demand from those Western furnaces that have been making pig iron for the Eastern Bessemer mills. If there is a break in the prices for hard Bessemer ores, others certainly will follow; for if these cannot sustain themselves, others cannot. It is also a fact that, in the West, Bessemer works are making more of their own pig than ever. Cambria is increasing its furnaces and putting old ones in blast. The Edgar Thomson is building three, one of which will soon be in blast, and one of the others before the year is out; and Cleveland is increasing its capacity for the manufacture of pig. The ultimate influence of this action will be to cheapen the ores to these consumers. The Menominee Range ores are an uncertain factor, but they give promise of being good Bessemer ores, though not so rich as some of the Marquette ores. With all this before us, we would rather wait a few months before venturing a prophecy.

The Pittsburgh Pumping Engines.

We print on the first page of this issue a second article on the remarkable pumping engines built for the Pittsburgh Water Works, with some diagrams which will be of interest to engineers. This now famous piece of machinery certainly merits the celebrity it has obtained, and if it does not make its designer immortal, it will be because future generations are more charitable than we can reasonably expect they will be. Our only reason for calling attention to it is with the hope that those who, in future, have public money to spend, will take warning by the example of the Pittsburgh authorities and not waste treasure in foolish experiments. In this instance the experiment may be not inappropriately compared to the work of one who makes elaborate preparations to draw a load by means of a three-horse equalizer, and then incontinently hitches four horses to his load, under the impression that four horses will distribute the work more equally than three. Inventors are very useful and estimable people, but we cannot commend the wisdom of letting them demonstrate, at the public expense, the impracticability of ideas which any intelligent student of the principles of steam engineering would know to be at variance with the laws of nature. It would be kinder, as well as cheaper, to let them grow old cherishing the conviction that they had made a great discovery in mechanics, which an unsympathetic world was not yet ready to appreciate.

We need hardly point out the absurdity of lifting the whole body of water necessary for the supply of a great city, to the hight necessary for a small "high service" district. The increased cost is in no way returned, because if the pressure due to the head is maintained in all the mains, the water users throughout the city are burdend with providing for an unnecessarily heavy pressure, which is both inconvenient and expensive. On the other hand, if the water is allowed to flow down to a lower point before distribution, and so reduce the pressure in the mains, a part of the power originally expended in lifting it is as absolutely wasted as though the coal had been thrown out and burned on the ash heap.

In designing the engine, the inventor seems to have first attacked the problem of starting and stopping the column of water in the rising main. He wished to start the plungers slowly, gradually increase the speed until the maximum was reached, and then allow the momentum to expend itself gradually, closing the stroke as quietly as it was begun. The triangular beam offered a means of accomplishing this end; but with an evident desire to do things differently from others, he laid the engine on its side, and instead of treating his triangular beam as a walking beam, as was the natural and philosophical method, he converted it into a bell crank, fastened his horizontal engine to one end, and lengthened out the whole machine most inordinately. As a consequence, the very heavy strains have to be transmitted not only through long distances, but by indirect routes.

In working out the angles and proportions of the beam, an evident effort was made to utilize all the advantages obtainable by the angularity of the connecting rods, to secure an easy stopping and starting of the plungers. This having been satisfactorily accomplished, it would seem that the subject was dismissed from the designer's mind, and his attention turned to the engine which was to drive this complex bell-crank rotative pump. The bell-crank, as arranged by the inventor, is intended to utilize the varying power of a single cylinder engine cutting off short, the expenditure of power corresponding fairly with the indicator card. Looking at the engine, we find that the inventor was profoundly impressed with the advantages of "compounding," and the superior economy thus obtained. He is also, apparently, struck with the great advantages which this form of engine gives in the uniformity of pressures and regularity of motion throughout the stroke. These advantages are greatly increased by coupling two engines at right angles. This was accordingly done, though, it would seem, without any consideration of the relation which the compound principle would bear to the "graduated" bell-crank at the other end of the connecting rod. It needs very little consideration to show that the two systems are at war. In the machinery preparation has been made for utilizing a pressure which steadily decreases from the cut-off to the end of the stroke, but we find, upon examining the engines, that an attempt has been made to give a regular pressure from the beginning of the stroke to the end. We have no desire to do injustice to the gentleman whose name has become so widely known in connection with these engines. It is quite probable that he regrets his mistakes more than anyone else can, but, unfortunately, that does not help the matter any. He may at least console himself with the reflection that he has made a contribution of no little value to engineering progress, by showing how compound pumping engines should not be built. The only question is whether this knowledge is worth what it has cost.

The Canadian Tariff.

The Hamilton (C. W.) *Evening Times*, which claims to know something about the tariff bill about to be reported to the Canadian Parliament, gives the following items as indicating the range of the proposed duties:

Wheat, per bushel	20¢
Rye and barley, per bushel	15¢
Indian corn and oats, per bushel	10¢
Wheat flour	20%
Rye flour and corn meal	10%
Oatmeal, per bushel	½¢
Potatoes, per bushel	15¢
Live animals	20%
Salt, per 100 lbs.	8@12¢
Wool	25@50%
Flax, dressed, per ton	$40
Flax, undressed, per ton	$20
Flax seed, per bushel	20¢
Starch, per lb.	1¢ and 20% ad val.
Butter, per lb.	4¢
Cheese, per lb.	4¢
Trees, plants and shrubs	20%
Coal, per ton	$1@$2
Pig iron, per ton	$7
Bar iron	35@57½
Plate and boiler iron, per ton	$25@$30
Iron rails, per ton	$14
Steel rails, per ton	$25
Bricks	20%
Sewing machines	45%
Stoves and castings	30%
Cars and locomotives	35%
Wood screws	50@60%
Saws	40@50%
Guns, &c	35%
Umbrellas and parasols	35%
Carriages	35%
Furniture	35%
Glass bottles and chimneys	35%
Clocks	35%
Envelopes and writing paper	35%
Room paper	35%
Rubber and leather goods	35%
Furs	35%
Felt hats (wool)	35%
Machinery	35%
Cotton yarn	46@60%
Spool thread	47@81%
Heavy cottons	40%
Finer cottons	50@70%
Silks	50@60%
Woolen cloths	66@200%
Flannel blankets	85%
Ready-made clothing	35@60%
Carpets	50@84%
Alpaca goods	85%
Marble	70@120%
Gloves, kid, &c	50%
Gunpowder	60%
Pencils	90%
Linseed oil	55%
Steel pens	40%
Soaps	46@54%
Varnish	40@56%

We give this for what it is worth. Probably Sir John A. Macdonald will find that framing out of whole cloth a tariff which shall please everybody, is a very difficult matter; and we may expect a lively fight between conflicting interests when the bill comes up for discussion.

The California Freight War.

It is a very interesting fight, as the case stands, between the Union Pacific Railroad and the shippers and commission merchants engaged in forwarding freight via Cape Horn. Two or three clippers are now loading, and one of them, the M. P. Grace, is about ready to sail with 3000 tons of freight, to be followed by the St. David in a few days. The railroad "spotters," it is said, carefully watch every package landed on the wharves, to detect any of their contractors who may happen to be engaged in "clandestine" shipments via the sea route. Sometimes a known name is discovered, and the shipper must look out for consequences. More frequently the names and marks defy detection, and there is reason to believe that considerable shipments of goods to the Pacific Coast are making an account of firms who have promised "not to do so any more." It cannot be supposed that they are so dishonorable as to violate their contract, but it is possible that third parties and "wicked partners" are doing it. According to a California telegram, "some of the railroad contractors are shipping by the Cape, which will probably cause lawsuits when the goods arrive." Judging from the ear-marks, this intimation of dreadful things to come may have originated in the Union Pacific office.

In keeping with the above is a report in circulation, which we have taken pains to corroborate, to the effect that one of the largest California shippers via the Horn, who was desirous of forwarding certain goods by rail for the sake of greater dispatch, was refused a rate—at least until he had submitted to a close cross-questioning as to what disposition of the goods was intended, who were the consignees, &c. It is apparent enough that while merchants, as the rule, prefer to submit to humiliating conditions rather than engage in open warfare, the railroad is inviting rebellion by using its whip a trifle too vigorously. Few men in the business have capital to expend in fighting a large corporation single-handed. For the present, therefore, it is likely they will try what virtue there is in an artful dodge. We learn that the ships around the Horn are taking large quantities of hardware, machinery and agricultural goods, besides iron, coal, stove castings, glassware, &c.

Last week we began the publication of extracts from letters of United States consuls and commercial agents, concerning the prospects of the American stove trade in their various localities. Continuing these extracts elsewhere, we present the reports made by our consuls in Germany. We would call attention, however, to an inaccuracy which has found its way into some of these letters. It is stated in several that the German Government imposes a duty on imported stoves. This statement is incorrect. Since the 1st of January, 1877, Germany has been open to all iron goods. There is, however, a duty of about $2.50 per 100 pounds on nickel-plated goods, and shippers of stoves to German ports would do well to take the nickel trimmings off and send them separately. In that case they would pay duty on the nickel trimmings, whereas if these were sent with the stoves, it is probable they would be appraised as nickel-plated goods, and taxed per gross weight at the rate named above.

New Publications.

MODERN SURFACE ORNAMENT.

We have received from Mr. J. O'Kane a portfolio of 24 plates, entitled "Modern Surface Ornament," which we consider one of the most useful contributions ever made to the pictorial literature of decorative art. As its name implies, it is a series of designs in great variety for the ornamention of surfaces. An almost bewildering variety of detail ornament is given, such as panel and corner filling, borders, centers, diapers, &c., and the practical designer will find it of the greatest use in suggesting ideas and treatments. Very many of the designs seem to be especially adapted to wood, and the student of wood carving could not do better than to study its pages very carefully. We know of no better examples of conventionalized ornament than are given in this work, and none which will be more useful to any one whose daily work or natural taste leads him in the direction of decorative art in its industrial applications. Mr. O'Kane is doing much for art progress in publishing this and other excellent works of design, and we hope his labors will meet with hearty encouragement from the trades they are especially designed to benefit.

Messrs. Geo. C. Tracy & Co., patent lawyers, of Cleveland, Ohio, and 519 Seventh street, Washington, D. C., have published for gratuitous distribution a book of 100 pages, entitled "All About Patents," which contains the laws of various countries in regard to patents and much valuable information. They will send it to all applicants.

The Peru Steel and Iron Company's Affairs.—The failure of the Peru Steel and Iron Company, of 91 Reade street and Clintonville, N. Y., is announced, and on the application of Charles Bliven, the president, and the board of trustees, F. J. Dominick has been appointed receiver. The company was incorporated in April, 1865, Charles Bliven being president, E. S. Dodge, treasurer, and Wm. H. Gunther, H. A. Harvey and W. H. Cudlipp, trustees. The capital was $200,000, and the company purchased 20,000 acres of land, several iron and plumbago mines at Clintonville for $456,000, and improvements to the extent of $200,000 were made on the property. Until about four years ago the company paid regular dividends. The falling off in the demand and the great reduction in the price of iron embarrassed the company, and the production of the mines was, during the past year, limited for want of ready cash. The company was no longer able to meet matured and maturing obligations. Upon the approval of all the trustees and the largest creditors the application for a receiver was made, by which a gradual winding up of the company's affairs might be accomplished. Bradstreet reports the total liabilities at about $200,000, of which $142,500 is the bonded debt. The assets are nominally $1,000,000, consisting of real estate and the usual mining appointments, which it is thought will realize enough to pay all the liabilities and leave a dividend to the stockholders. Between 400 and 500 men are usually employed at the mines, which will be kept running by the receiver. Mr. Bliven, the president, says the company had not made any money for some years. He had advanced the money to carry on the work and given his indorsements to their paper, all of which he had taken up and paid before maturity out of his own pocket. The entire liabilities, he says, will not exceed $200,000, and the floating debt is about $50,000. He believes all the creditors will be paid in full.

Coming to Nature.

The following very clever verses were read at the dinner of the American Institute of Mining Engineers, at Baltimore, on the evening of Feb. 21st, by Mr. A. L. Holley:

A METALLURGIST'S ODE TO SPRING.

Hail, coming Spring, the metallurgist's boon,
Relaxing mines and streams closed all too soon
By cold unchemic, which alike defeats
Reactions, fusions, malleable heats.

Refractory winter to the solving Sun
Yields its cold gangue while fluid offerings run,
And Nature's furnace, scaffolded within,
By coming Spring is once again blown in.

Now draws the pump upon the river shore,
Now o'er the wheel the new freed waters pour;
The frost shall burst hydraulic pipes no more,
Nor Pat slow pick the ice-bound piles of ore.

No more shall piston-heads on water pound
From steam condensed in pipes meandering round;
The supple belt shall to the pulley bend,
The oil-cup to the shaft its unguent send.

The furnace charged with coal and ore *sans* snow,
The gas producer and the "cupalo;"
These now their functions normal shall perform,
As summer zephyrs keep their bottoms warm.

Thus while the sun these chiefest blessings sends,
It spares some heat to secondary ends;
The seed time to the husbandman it grants,
His sisters and his cousins and his aunts.

The bursting buds of Nature's gasogéne,
Her sand bath and the sprouting seeds within,
Th' exuding slag from maple saccherine,
The "spiegel" concentrating in the vine,

The flowers resplendent to the visual sense
As all the spectra of the elements,
And their reactions all, by spring begun,
Shall be wash-heated by the August sun.

The verdant foliage in a blooming-train,
Where the Spring sun doth roll his beams again,
O'erspreads the fields wet down by tempering rain
From clouds hydraulic lifted from the main.

Anon the direct process Nature takes,
And o'er and o'er her spongy products makes;
Her open-hearth with blasts reverberates,
And casts in mineral molds her various shapes.

And now the cock doth sound his liquid lay;
The bull dog seize the ox hide in his play;
The bear within his silex cell shall dig,
And in the puddle-roll the sow and pig.

So genial Spring doth all things put in gear;
Eccentric there, with fly-wheel action here.
Producers thrive, the merchant rolls in wealth;
And here's a ladle to our miners' health.

Metallurgical Notes.

KRUPP'S PROCESS FOR DEPHOSPHORIZING PIG IRON.

German metallurgists have spoken with much confidence of Krupp's process for dephosphorizing pig iron, although no detailed statements as to the method or its results have been published in foreign journals. The only thing that was generally known was that the direction which experiments had been taking at Essen was similar to that pursued by I. Lowthian Bell in England. In a recent number of *La Métallurgie*, Mr. A. Lencauchez, a well-known engineer, gives a full description of Krupp's application for a patent, from which we take the following information: In order to eliminate the impurities from pig iron it is mixed, when in a fluid state, with oxide of manganese, which carries into the slag silicon, sulphur and phosphorus. As long as notable quantities of these elements remain, the carbon is but little affected by the oxidizing action, and therefore its fluidity is not impaired. The pig is either taken directly from the blast furnace, or from a remelting cupola or reverberatory, and run on a hearth covered with oxides of iron and manganese, or both, previously heated to a high temperature, and after it has been purified, it is either cast or taken directly to a furnace having a silicious hearth, where it is converted into the product required by any of the means now generally practiced. The cinder formed having a specific gravity lower than the pig, is easily separated. It is claimed that the chemical reaction is a very rapid one, not requiring more than 5 to 15 minutes for a charge of 5 tons. While the impurities are being eliminated, no change perceptible to the eye takes place, but as soon as they have passed into the slag the carbon of the pig begins to be oxidized, which is immediately recognized by the rising of gas bubbles, thus showing a characteristic reaction. Before running in a new charge a layer of manganese of sufficient thickness is spread over the hearth.

A TEST OF THE HAY PROCESS STEEL.

Since the article on the Hay process steel for structural purposes appeared in *The Iron Age*, we have learned of a most severe test to which the quality of this steel has been put, by the falling of one of the spans of the Glasgow (Mo.) bridge. It will be remembered that this bridge is entirely of this steel. Work on it has been delayed through fear of danger from breaking of the ice, but early this month work was begun on one of the through spans. On the 9th the river began to rise, and apprehensions were felt that the span could not be finished before the ice gave way. All night of the 9th work was kept up. At 10 o'clock in the morning of the 10th every upright was in position, and in six hours the span would have been ready to swing, when the ice broke about a mile above the bridge and came floating down, carrying away the false work and throwing the span into the river, the fall being 85 feet and the depth of water 6 feet. At first it was supposed that the entire material would be of no value except as scrap, and the loss was accordingly placed at $37,000. Examination, however, showed that though some of the members were twisted and bent, there was scarcely a broken piece in the whole 250 tons. Nearly all can be used, so that the loss is thought to be within $5000. This is a most satisfactory result. The great fear has been that the steel in the bridge would not stand the shock of a derailment. That the steel would break instead of bending, but this test seems a sufficient answer.

GOOD STEEL FROM ORES OR POOR PIG.

Another claimant—or, rather, other claimants—for the great prize in waiting for the successful inventor of a method of using phosphoric pig for the manufacture of steel, is heralded by a correspondent of *Iron*. Unfortunately, death has snatched away the inventor, Mr. John Perry Downing, of Newcastle-on-Tyne, before he was able to reap the reward of his ingenuity, but apparently his heirs are fully equal to the occasion, and are sufficiently eager to receive what is due them. The mode of operation is described thus: "He places in a furnace or cupola, lined in an efficient manner, say 1 ton of pig iron of a poor description, such as that of Cleveland, with from 25 to 65 lbs., or thereabouts, of the scoria obtained from puddling or mill furnaces, and about 100 lbs. of good scrap iron. When these are melted, the furnace or cupola must be run to a heat at which cast steel melts. This heat must be continued for 30 or 40 minutes, when it will be found that the scoria will have taken up such impurities as have not been volatilized, and this, which will float on the furnace, must now be tapped off. Then from 25 to 66 lbs. of the rich oxide of iron—called by mineralogists hematite—is added, and the whole lightly stirred together. After this, 3 ozs. of black oxide of manganese must be placed in the furnace, to be immediately followed by from ½ lb. to 3 lbs. of chloride of ammonia. The furnace or cupola is now run again for about 30 minutes, at the end of which time about 100 lbs. of spiegeleisen should be added, the whole mass being immediately stirred once or twice. Great care has to be taken not to puddle or boil the contents of the furnace or cupola. When the whole is at a great heat, the contents of the furnace are run into ingots ready for use. The production of refined iron and steel is claimed by the mode of operation here stated, the result being effected by the vaporizing of injurious elements, by means of great and varying degrees of heat in one single furnace operation, and by the use of the ingredients named and the peculiar manner in which they are employed, the chemical combinations acting and reacting upon each other in such a way as to eliminate detrimental bodies by a species of synthesis, and by introducing nitrogen into the iron, thereby converting it into steel." This, we hope, will set the vexatious question of making good steel from impure pig at rest, and banish the gaunt specter of phosphorus forever. But we are not without private doubts.

The "Water Witch" Experiments Over Again.—The following is a short account of some new experiments lately made in France in the propulsion of vessels with a jet. From what we can learn, the experiment is not unlike those made years ago in England with the Water Witch: "There is said to be now in operation at Marseilles a steamship, whose peculiarity is that it has neither masts, screw nor wheels, and yet is reported to have made 10 knots an hour. It has, instead of an engine, an enormous pump, with tubes leading forward and aft, and progress is secured by forcing the water drawn from the sea against that in the sea, through one or the other of the pipes, according to the direction intended. The fragmentary reports state that the ship has met all expectations in preliminary trials." It is only a year or two since a similar experiment was made in this country upon a small tugboat. A large pump took water from some point near the bow and discharged it astern. It was reported that everything worked smoothly, and that about 10 miles per hour was obtained with the experimental apparatus. After the trial we were told that a new pump was to be put in, and then great results were to be expected. But so far the desired results do not seem to have been attained, and no more has been heard of the boat. The facts of these cases seem to be, that those who undertake the experiments do not have sufficient knowledge of hydraulics to make any valuable experiments. Their trials have lacked those elements of exactness necessary to make them available, and the result of it all is that we are none the wiser. The whole subject of jet propulsion is now just where it was when the pumps were taken out of the Water Witch years ago.

NEW METHOD FOR THE DETERMINATION OF COPPER.

F. P. Dunnington, of the University of Virginia, has described, in a paper read before the American Chemical Society, a new method for the determination of copper, or rather a modification of Prof. Edgar F. Smith's method. To the boiling dilute solution of copper he gradually adds a solution of carbonate of soda to slight excess, and then a dilute solution of caustic soda, until the precipitate blackens. The latter separates readily, and may be washed by five or six decantations with boiling water.

AMERICAN SCREW CO.,

Providence, R. I.,

MANUFACTURERS OF MORE THAN 4000 VARIETIES OF PRODUCT,

AND INCREASING THE ASSORTMENT DAILY.

Machinery employed contains important inventions recently patented, and which are designed to produce Screws at a **lower cost to the consumer** than has ever been attained.

All goods are distributed through the Hardware trade, to whom a liberal discount will be allowed.

(No. 235.)

INTERNATIONAL EXHIBITION.

PHILADELPHIA, 1876.

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.

PHILADELPHIA, November 8, 1876.

REPORT ON AWARDS.

Product: **Iron, Brass and Steel Screws, Tire and Stove Bolts, Rivets.**

Name and address of Exhibitor: American Screw Company, Providence, R. I.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for Award, for the following reasons, viz:

Being of a quality nearly approaching perfection, showing the highest attainment in this branch of manufacture.

G. L. REED. Signature of the Judge.

Approval of Group Judges.

Daniel Steinmetz, G. L. Reed, J. Diffenbach,
Jas. Bain, J. D. Imboden, Dav. McHardy
Chas. Staples,

A true copy of the record. FRANCIS A. WALKER, Chief of the Bureau of Awards.
Given by authority of the United States Centennial Commission.
A. T. GOSHORN, Director-General.
[L.S.] J. L. CAMPBELL, Secretary. J. R. HAWLEY, President.

After forty years' experience we offer to the trade our Centennial Screws, patented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the improved article only. To introduce them, they will be sold at the same price as the old style screw.

The new screws will be packed in manila colored boxes with the new label covering end of box, and enlarged figures showing plainly contents.

To distinguish this screw we have adopted a trade-mark, which is also secured to us.

The accompanying engravings show the progress of making screw from the old blunt point to style now adopted.

Experience has shown that the weak point of screws, as formerly made, is at the heel of the thread, where all the strains of forcing the screw into the wood naturally concentrate.

To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated. See sections at lines.

CLAIM.

"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

The American Institute of Mining Engineers.

BALTIMORE Saturday, Feb. 22, 1879.

The annual meeting of the American Institute of Mining Engineers was held here this week, and was probably the largest and most interesting in the history of this society. The sessions were held in a commodious hall adjoining the lobby of the Academy of Music. The Institute was called to order at 8 o'clock on Tuesday evening by the president, Mr. Eckley B. Coxe. It was expected that some notice of the meeting would be taken by the citizens of Baltimore, especially as a number of leading business men had signed a circular, which had been sent to all the members, indicating their intention to show the Institute such courtesies as might be necessary to make their visit a pleasant one. We regret to say, however, that but one citizen of Baltimore was present at the meeting, and as he did not feel authorized to represent anybody but himself, there was no address of welcome nor offer of attentions. It was afterward explained that this seeming discourtesy was the result of a series of *contretemps;* that the Mayor and others had intended to be present and welcome the Institute, and that the citizens of Baltimore were greatly annoyed that their reputation for hospitality should, in this case, have suffered so severely. However, as no dependence had been placed upon the attentions that were not received, the Institute proceeded to business in a very practical way, confident that the members could take care of themselves and have a good time of their own making. About 75 members were present at the opening, among whom were the following: Chas. A. Ashburner, Philadelphia; A. S. Bertolet, Crown Point, N. Y.; John F. Blandy, Philadelphia; F. A. Canfield, Dover, N. J.; Eckley B. Coxe, Drifton, Pa.; W. E. C. Coxe, Reading, Pa.; F. H. Daniels, Worcester, Mass.; H. S. Drinker, Philadelphia; Dr. Thomas N. Drown, Easton, Pa.; P. H. Dudley, New York; Prof. Thos. Egleston, New York; W. E. C. Eustis, Boston, Mass.; Frank Firmstone, Easton, Pa.; Edward Gridley, Wassaic, N. Y.; Oswald J. Heinrich, Drifton, Pa.; F. N. Holbrook, Brooklyn, N. Y.; A. L. Holley, N. Y.; Robert W. Hunt, Troy, N. Y.; Prof. T. S. Hunt, Boston, Mass.; W. R. Jones, Pittsburgh, Pa.; C. W. Kempton, Boston, Mass.; James F. Lewis, Amenia, N. Y.; Chas. McDonald, New York; Wm. Metcalf, Pittsburgh, Pa.; W. G. Neilson, Pittsburgh, Pa.; Edward Nichols, Tarrytown, N. Y.; James Park, Jr., Pittsburgh, Pa.; Charles O. Parsons, Dauphin County, Pa.; Prof. R. H. Richards, Boston, Mass.; P. Roberts, Jr., Philadelphia, C. H. Roney, Philadelphia; Wm. P. Shinn, Pittsburgh, Pa.; Henry C. Walton, Saratoga, N. Y.; R. W. Raymond, New York; B. R. Weston, New York; Geo. H. Frost, New York; J. C. Bayles, New York, and others.

THE PRESIDENT'S ADDRESS.

The President opened the session with an interesting address on "Secondary Technical Education" He began by urging the importance of giving mining apprentices better opportunities for acquiring enough technical education to make them not only good workmen, but available candidates for promotion to positions of trust and responsibility which, if filled by ignorant or incompetent persons, deprived the engineer of the advantages of intelligent co-operation and assistance. He thought this subject had not received sufficient attention in this country. He spoke at length of the system of schools in Europe, at which persons working in the mines were taught surveying, geology, drawing and other elements of mining, and argued favorably for its adoption in this country. In Germany, he said, promotions at the mines were made in a manner similar to those in the army. He thought that the United States is entering upon a new epoch in connection with mineral and metallurgical interests, and the time would soon come when her products would find a ready market in every part of the world. He spoke of the great advantages enjoyed by this country, the intelligence of labor, and other facts tending to this end. He advocated the education of all persons connected with the mining interests, and claimed that in view of the advancement of the iron and steel interests, the education of the working classes is greatly to be desired. Mr. Coxe also spoke at length on the immense importance of the anthracite coal fields of Pennsylvania, and particularly of the moral and social condition of the miners, which should be improved by educating the youths. It is not enough to educate the foremen and engineers of the mines, but the miners as well should enjoy the advantages of improving their intellects. In conclusion, Mr. Coxe described schools which are now about to be established at the collieries of Drifton. All of the boys who work in the mines and the sons of the miners are taught during leisure hours.

The course of study would occupy two or three years, and is so arranged that the apprentice will be given opportunities of applying in his daily work that which he learns in the school. The course will include algebra, geometry, trigonometry, drawing, geography, physics, framing, English composition, book-keeping and penmanship. They will also have supplementary instruction in mine surveying. The elementary instruction imparted will be adapted to the intelligence of the students, and whatever is taught will be carefully sifted, to avoid creating false impressions or giving wrong ideas. The students will also have medical instruction in the treatment of wounds, burns and other accidental hurts, so that victims of such accidents need not be left in suffering until the arrival of a physician.

Experience would show him what could be added to the course and what omitted without disadvantage, and he hoped the school would result in important benefits, not only at his own mines, but to the whole anthracite mining interests.

Dr. Egleston opened the discussion on Mr. Coxe's paper. He thought the Institute ought to take more than a passing notice of so important a subject. He had long been impressed with the importance of a system of popular education in technical branches for mechanics and apprentices. It was a noteworthy fact, that the only schools of this kind which have failed of complete success are those which have been established under Anglo-Saxon auspices. He advocated the adoption of measures looking to the general introduction of a system of elementary technical education, and thought the Institute ought to suggest a plan by which instruction of this kind could be made a part of the common school system of every State. The matter was one that could not properly be left to individual mine owners and employers, who might be induced to establish such schools for purely benevolent considerations. Some other discussion followed, but no further action was taken.

A committee, consisting of Messrs. Coxe, Egleston and Holley, were appointed to consider the subject and make a report to the Institute.

Mr. A. L. Holley read an interesting paper on the testing machine at the Watertown Arsenal, which we print in full in another column.

Dr. Raymond followed with some well-timed remarks, in which he spoke of the excellent work of the United States Commission, the importance of continuing its labors, and the probable reason why it had been overlooked by Congress in the Appropriation bill. In view of the great importance of the work which this board had so well begun, every member of the Institute should use his personal influence to secure a favorable consideration of its claims by Congress. The work it had undertaken was of direct, immediate and practical benefit to the government, and for this reason Congress should see that it was continued by this commission, or by one equally competent.

Dr. T. Sterry Hunt followed with a paper on the development of the Hocking Valley, in which he called attention to some predictions he had made to the Institute five years ago, and which he claimed had since been vindicated by the establishment there of a great and growing iron industry.

A brief discussion, which showed that a good many of the members had ideas of their own on this subject which were not wholly in accord with Dr. Hunt's views as to the future of this district, brought the session to a close.

THE SECOND SESSION.

At the first session of Wednesday several additional members were present, among others: William B. Coggswell, of Mine La Motte, Mo.; D. N. Jones, Johnstown, Pa.; J. H. Bramwell, Quinnemont, W. Va.; Martin Coryell, Lambertville, N. J.; Levi Holbrook, New York; Jas. A. Burden, Troy, N. Y.; J. F. Torrance, Montreal, Canada; J. F. Alexander, Philadelphia, Pa., and C. E. Stafford, Harrisburg, Pa.

The chairman called the association to order at 10 o'clock, and, in the absence of Dr. Drown, Dr. Raymond was chosen secretary *pro tem.* An invitation to the Institute to visit the Johns Hopkins University from Prof. D. C. Gilman, was read and accepted. The order of business was the discussion of Dr. Dudley's paper on the chemical composition and the physical properties of steel rails. This paper, it will be remembered, was read at the Lake George meeting last fall, and is regarded as one of the most important communications ever presented to the Institute. The discussion was opened by Mr. Robert Hunt, superintendent of the Bessemer Steel Works at Troy. The chief points maintained by him were, that the experiments upon which Dr. Dudley's conclusions were based were not numerous enough to warrant the establishment of his formula. He urged further that the breakage of many rails was largely due to mechanical treatment before leaving the rolling mill, particularly in the cold straightening press. He pointed to the fact that an increase of phosphorus in the rail called for an increase of manganese. He stated that since 1871 the Troy Works had changed their policy, their object being since that time to aim at a .36 carbon rail, and cited a number of reports from roads showing how well the change worked. He stated that a number of very successful rails showed a sum of "phosphorus units" by far beyond the limitations as given by Dr. Dudley. He protested vigorously against Dr. Dudley's statements in regard to the effect of silicon, supporting his position by numerous examples. We shall give this paper in full in a future issue.

Mr. Eustis read a paper by H. M. Howe, of Boston, suggesting that, as a mechanical test might give the exact information as to extent, and the chemical test *prima facie* evidence of the composition and properties of steel rails, both should be used. He thought chemical test should be admitted a strong *prima facie* evidence, liable to be refuted by conclusive mechanical evidence.

Prof. Egleston agreed with Mr. Hunt, that the data on which Dr. Dudley's conclusions were based were insufficient. He gave some interesting statistics of the life of steel rails on French roads, and exhibited two sections, one, cut from a rail badly worn and deformed in service on the track of the Hudson River Railroad, in Hudson street, New York; and the other, worn without deformation, on the track of that road near Spuyten Duyvil. He thought that neither mechanical nor chemical tests alone would be found sufficient, and urged the engineers to take up the question of physical properties, and not leave this matter wholly to the chemists. Mr. W. P. Shinn, of the Edgar Thomson Steel Works, discussed the paper from a manufacturer's standpoint. He claimed that Dr. Dudley had been misunderstood, both by members of the convention and the public. His paper had been criticised on the supposition that he established a principle. He (the speaker) did not think Dr. Dudley's hypothesis would be fully sustained, and the positions of the latter were calculated to be misconstrued. Dr. Dudley's investigations were of the greatest value, but were not conclusive, and could not be accepted by the manufacturers as final. The steel manufacturers were willing to make rails to any practicable specifications, if consumers were willing to pay what such rails were worth, but it could not be supposed that, in the present state of the market for steel rails, they would take orders embodying requirements based upon Dr. Dudley's conclusions. Mr. Jones continued the discussion until half past twelve. At this hour it was necessary to adjourn, in order to accept the invitation of President Gilman. The Institute then proceeded to

THE JOHNS HOPKINS UNIVERSITY.

They were received in the lecture hall by President Gilman, who made a brief address, in which he acknowledged his pleasure at seeing so many scientists present. He gave a brief history of the institution, the construction of which, he said, had been originally designed on the grounds adjoining the Johns Hopkins Hospital, but the trustees decided to build in the heart of the city. He explained the situation of the building, its appointments, &c., and said the operation of the university was of small magnitude, but it was deemed best to increase its work gradually. The various branches embraced mathematics, physics, chemistry, Greek, biology and other studies, and the faculty comprises a staff of 19 professors and 20 fellows.

The roll of students of the university since its organization, three years ago, numbered 211, and more than half of them had previously taken college degrees elsewhere. The university had been planted by Mr. Hopkins without any general manifestation of interest on the part of the people of Baltimore, but a system of afternoon lectures on scientific subjects has attracted a number of the educated people of the city. Prof. Gilman explained the objects and administration of the institution, and in conclusion extended a sincere welcome to the visitors, who were subsequently conducted through the various departments and served with a lunch.

WEDNESDAY AFTERNOON SESSION.

The Institute reassembled at 3 o'clock, and Mr. Charles A. Ashburner, of Philadelphia, was invited to demonstrate the operation of the American surveying transit, invented by Prof. J. H. Harden, of the University of Pennsylvania, after which the discussion on Dr. Dudley's paper was resumed.

Dr. Dudley continued the debate on the subject of steel rails by an able, logical and eloquent defense of his experiments and the conclusions he had drawn from them. Referring to the position taken in Mr. Hunt's paper, he said that the breakage of rails was a matter of very small consequence. Owing to the enormous progress which has been made during the past few years in the construction and maintenance of road-beds, there had been a great decrease in the number of broken rails, and the danger and expense resulting therefrom were items so unimportant that they might properly be left out of consideration. The crushing of rails was a great deal more important to the consumer, and was due, in his judgment, rather to defects in the composition of the metal than to imperfections in the rail, caused in process of manufacture. He regretted that his conclusions had not been drawn from a much greater number of tests, but from those made he had deduced what seemed to him a reasonable theory of the relation of chemical composition to physical properties. This theory, or, more properly, hypothesis, was the only one which would fit the facts; and while he held his conclusions subject to revision should a larger knowledge of facts render such revision necessary, the corporation in whose interest his experiments had been made considered it to their advantage to prescribe the formula they had offered to the steel makers, as the one most likely to give them rails that would produce the best results in service.

The discussion which followed Dr. Dudley's remarks was probably the most brilliant, witty and scientifically interesting to which the Institute has ever listened. Messrs. Holley, Raymond, Robert Hunt, T. S. Hunt, Egleston, Metcalf, Kent, Torrey and others took part, and when it was necessary to terminate it, in order to afford time for other papers of interest, the chair announced that one session at the Pittsburgh meeting in May next would be devoted to the further consideration of this subject.

WEDNESDAY EVENING.

The attendance at the evening session was somewhat reduced by the superior attractions of "Carmen," which not a few of the members preferred to the regular papers of the meeting. The first paper was read by Chas. McDonald, of New York, describing Kloman's method of rolling eye-rods. We hope to describe this process fully in a future issue of *The Iron Age.* Mr. A. L. Holley read a paper on the Pernot Steel Furnace, which we shall print in full in a future issue. This paper was discussed by Mr. C. E. Stafford, of Harrisburg, who illustrated some improvements in the construction of open-hearth steel furnaces. Mr. J. F. Blandy, of Philadelphia, followed with a paper noting some interesting points of resemblance between the epidotic rocks of the Lake Superior copper formation and those of the South Mountain copper region, on the Maryland and Pennsylvania line. Mr. Blandy gave some interesting geological facts, from which he argued that the resemblance was not merely due to a coincidence of local geological features, but that it must be accepted as showing that the two formations belong to widely extended series of rocks. Dr. Hunt, in the discussion which followed, called attention to points of dissimilarity which were quite as marked as those of resemblance. Prof. Egleston agreed with this view. Mr. Frank Firmstone showed some large copies of the indicator cards of a remarkable water-pressure blowing engine of the Longdale Iron Co., Virginia. At 10 o'clock the session was adjourned, which gave the younger members, as well as some who were not so young as they once were, a chance to wait in the lobby of the Academy of Music, to see whether the ladies coming out of the opera were as beautiful as Baltimore ladies are reported to be. We believe that the general conclusion was that the popular idea on the subject was not vindicated by the facts of the case.

THURSDAY MORNING SESSION.

The final session began at 11 o'clock Thursday morning, the president in the chair.

Mr. John S. Alexander, of Philadelphia, chairman of the Museum Committee, submitted a full report, showing that the work of installing in Memorial Hall, Philadelphia, the donations and metallurgical specimens made to the Institute by foreign governments and other exhibitors at the Centennial Exhibition, had made favorable progress, and that for 18 months two large saloons in that building, containing some of the most important specimens of the collection, had been open to the public. The report stated, further, that arrangements had been effected whereby these collections would remain permanently in Philadelphia, under the care of the Pennsylvania Museum and School of Industrial Art, which society now occupies Memorial Hall, in Fairmount Park. The report also set forth a plan for classifying and arranging, from the specimens not yet displayed, a cabinet collection illustrating the economic metallurgy of the world, there being specimens of the ores, fuels and fluxes, together with examples of the metallic products, of sufficiently wide range to form a very complete collection. The financial statement of the committee showed receipts of $2149.77; expenditures, $2113.81. The report was adopted and the committee were discharged with a vote of thanks.

Prof. Frazier, of Philadelphia, was called upon and made a brief address on Mr. J. F. Blandy's paper on "The Lake Superior Copper Rocks of Pennsylvania," which was read at the preceding session. Prof. Hunt, of Montreal, also spoke on the subject.

Mr. Charles A. Ashburner, of Philadelphia, read an interesting paper on "The Bradford Oil Region of McKean County, Pa.," illustrated by a cabinet containing 312 samples from the borings of the Dennis oil well. Mr. Heinrich read a paper on the manufacture of soda by the ammonia process. Mr. Firmstone gave an abstract of a paper on the great blast at the Glendon limestone quarries, by Ellis Clark, Jr.; and Dr. Raymond an abstract of a paper, by Ellsworth Daggett, on an improved system of Cornish pit-work.

Dr. Drown read a short paper on the determination of silicon, and a number of other papers were read by title.

The report of the Governing Committee of the Institute showed that during the last year the membership was increased by 46 members and 13 associates. The total membership now consists of 5 honorary, 52 foreign, and 543 active members and 134 associates. The Institute has recently received from the Russian imperial department of mines a collection of 28 Russian mineral specimens, in exchange for samples of coke and coal mineral presented to Prof. Nicolsky during the centennial year.

The scrutineers appointed to examine the ballots received by mail for officers for the ensuing year, reported the election of the following gentlemen: President, Eckley B. Coxe, of Drifton, Pa.; vice-presidents, H. M. Howe, R. H. Richards, Boston, Mass., and Samuel Thomas, Hokendauqua, Pa.; managers, W. E. C. Coxe, Reading, Pa., J. A. Church, Columbus, Ohio, and J. F. Lewis, Amenia, N. Y.; treasurer, T. D. Rand, Philadelphia, Pa.; secretary, Thomas M Drown, Easton, Pa.

MEMBERS.

Alfred F. Brainerd, St. Albans, Vt.
George W. Bromwell, Drifton, Pa.
Henry Burden, Troy, N. Y.
Maurice Chaper, Paris, France.
John W. Cloud, Altoona, Pa.
Thomas Couch, Salt Lake City.
Thomas R. Countryman, Hastings, Minn.
Geo. A. Cracker, New York city.
E. B. Dorsey, San Francisco.
Patrick Doyle, Perak, Straits Settlements, East Indies.
Theodore N. Ely, Altoona, Pa.
Edw. L. Ford, Springfield, Ill.
Henry Clay Frick, Pittsburgh.
Chester Griswold, New York city.
Henry C. Grittinger, Cornwall, Pa.
James Hall, Albany, N. Y.
Jed Hotchkiss, Staunton, Va.
Eliot C. Jewett, St. Louis, Mo.
Isaac G. Johnson, Spuyten Duyvil, N. Y.
Edw. de Laveleye, Liége, Belgium.
George Lincoln, Steel Works, P. O., Pa.
F. A. Lowe, Silver Islet, Canada.
John R. McGinness, St. Louis, Mo.
Carlos W. McKinney, Scranton, Pa.
De Coursey May, Baltimore, Md.
George S. Morison, 52 Wall street, New York city.
George C. Munson, Rosita, Col.
James W. O'Grady, West Farms, New York city.
Harry S. Peelor, Johnstown, Pa.
David Shaw, Pittsburgh, Pa.
Porter W. Skinner, Alburtis, Lehigh Co., Pa.
Robert W. Singer, Pittsburgh, Pa.
M. V. Smith, Philadelphia.
Sebastian Stutz, Pittsburgh.
Edwin Thomas, Alburtis, Lehigh Co., Pa.
W. W. Van Voorhis, Manhattanville, N. Y.
Charles E. Waite, Rolla, Phelps County, Mo.
John R. Williams, Johnstown, Pa.
Jones Wister, Harrisburg, Pa.
Theo. G. Wolf, Scranton, Pa.
F. W. Wood, Steel Works, P. O., Pa.

ASSOCIATES.

H. K. Bridgman, Carondelet, Mo.
James Constable, Constableville, N. Y.
Charles C. Dodge, New York city.
E. B. Ely, Jr., New York city.
Walton Ferguson, New York city.
Henry D. Hibbard, West Roxbury, Mass.
Charles S. Hinchman, Philadelphia.
Robert A, Shillingford, Philadelphia.

CHANGES FROM ASSOCIATES TO MEMBERS.

H. M. McIntire.
A. F. Schneider, Cincinnati, Ohio.
Nelson W. Perry, New York city.
A. W. Humphries, New York city.
C. Henry Roney, Philadelphia, Pa.

Resolutions of thanks were adopted to President Gilman and the Faculty of the Johns Hopkins University, and the Baltimore and Ohio and Pennsylvania Railroad Companies for courtesies extended, and the convention adjourned to meet at Pittsburgh, Pa., May next.

THE DINNER.

In the absence of any disposition on the part of the citizens of Baltimore to entertain them, the members decided to entertain themselves, and to use the elegant expression of one of the gentlemen, those who hungered and thirsted "chipped in" for a subscription dinner at Rennert's.

About forty were present, including a few guests. The dinner was fair, but the subsequent speechmaking was, in the average, pretty bad. Dr. Raymond made a very witty reply to the toast "The City of Baltimore," in which he indulged in a great deal of clever, but good-natured satire. Mr. Holley read the "Metallurgist's Ode to Spring," which we print on another page. These were the only ones present who had the forethought to prepare for the ordeal. The others were completely taken by surprise, and while they doubtless afforded much amusement to the company, the fun was very much like the handle of a jug—all upon one side. This plan of surprising speakers is open to many and grave objections, and defeats its own ends; besides causing the victims much profitless mental anguish when they recall, in the still watches of the night, what they did say, and compare it with what they might, could, would or should have said had they known that anything in the shape of a speech from them would be called for. However, the affair passed off with great hilarity, and everybody returned to the Carrollton about midnight in good order, and without giving evidence of having introduced too much "spiegel" into their respective converters.

From whatever standpoint considered, this meeting was a great success. The attendance was large, the papers valuable, the discussions lively, and the scientific interest sustained throughout. The Pittsburgh meeting promises to be even more successful—at least so far as its social features are concerned—and a large attendance may be expected.

The U. S. Testing Machine at Watertown Arsenal.*

BY ALEX. L. HOLLEY, C. E.

The 400-ton testing machine, ordered in June, 1875, by the U. S. board appointed to test "iron, steel and other metals," has lately been completed at the Watertown Arsenal, thoroughly proved and accepted by the board. The excellence of the machine in every respect is more than satisfactory, and its accuracy is at first sight astonishing, although an investigation of its principles must show that if the weighing apparatus will weigh at all, it must do so with perfect accuracy, because all its movements are absolutely without friction.

The proof experiments were numerous, and the effects of recoil after sudden ruptures at maximum loads, were watched with great care, but without much anxiety, because the weighing parts affected are by no means delicate in structure, and their motion is almost infinitely small. Among the tests were the following:

A forged link of hard, wrought iron, 5 inches in diameter between the eyes, was slowly strained in tension and broke short off with a loud report at 722,800 pounds. The diameter before breaking at the point of fracture was 5.04 inches; after breaking, 4.98 inches.

In order to see if the weighing parts had been disturbed by the recoil, which was obviously near the greatest recoil the machine will ever suffer, a horse-hair was next tested; it was 7-1000ths of an inch in diameter; it stretched 30 per cent. and broke at 1 lb. Other horse-hairs vary in tenacity between 1 and 2 lbs. Of course the accuracy of the machine on such delicate specimens, and indeed on specimens having some hundreds of pounds tenacity, has been checked and proved by other weighing machines.

A 5-inch round bar, turned down to 3⅛ inches diameter along the center, was pulled apart at 430,200 lbs. tension. Then some more horse-hairs were tested; also copper wires 19½-1000ths of an inch in diameter, which averaged 25 lbs. tenacity.

Specimens were subjected to 1,000,000 lbs. compression, although the contract calls for but 800,000 lbs. After these proofs delicate structures, such as eggs and nuts, were tested in compression, and violin strings in tension. It is unnecessary to multiply instances. It seems safe to conclude that bars and structures up to 400 tons can now be tested with perfect accuracy, and that there is no reason to fear the deterioration of the weighing apparatus.

It is not the purpose of this paper to describe the machine in detail, because foreign patents to the inventor and builder, Mr. A. H. Emery, are not fully secured. Speaking generally, the machine consists of a double-acting straining cylinder and ram on a carriage at one end, and a movable weighing apparatus at the other end. The two are connected by a pair of 8-inch screws 48 feet long. Nuts driven by shafting move the straining cylinder to different places on the screws, so as to test long or short specimens. The weighing apparatus has already been described in print as a reversed hydrostatic press, having diaphragms instead of pistons. The load is transferred, by means of a fluid (alcohol and glycerine), by a series of large diaphragms to a series of small ones, and finally, to a system of scale beams. Thus a weight of 800,000 lbs., acting through an inconceivably small space, finally moves a finely-graduated indicator at the rate of 1-100th of an inch per pound. It is allowed to move through a space of 2 inches, and is kept balanced by weights mechanically placed quickly on or off the scale beam. One pound, in moving the indicator 1-100th of an inch, moves the platform against which the load presses 1-42,000,000th of an inch. The whole arrangement of the scale beams, the adding and removing of weights, and the fast or slow, but always steady, application of pressure, are ingenious and convenient in the highest degree. By means of universal joints, the pressure pipes are always connected to the straining cylinder, &c., whatever their positions. The steam pump and the accumulator have cylinders and weights, respectively for high and low pressures, and the machine receives pressure without pulsation, from the accumulator only, when testing.

The machine was built at the works of the Ames Mfg. Co., at Chicopee, Mass. The principal castings (80,000 lbs. of gun iron) were made at the South Boston Iron Works, and the steel and iron forgings at the Nashua Iron and Steel Works. The finished

* Read before the Baltimore meeting of the American Institute of Mining Engineers.

metal in the machine weighs 175,000 lbs., and includes pieces of 14,000 lbs. down to those of which 250,000 would weigh 1 lb. The hydrostatic weighing platform of the machine was tested to 1,500,000 lbs., but so perfectly frictionless is it that a horse-hair, under a breaking strain of 1 lb., had to move 24,000 lbs. of metal. The workmanship is also remarkable. The 8-inch screws, 48 feet long, were fitted to gauges within one-thousandth of an inch in diameter throughout their length, and similar accuracy was maintained in other parts.

The cost to the government of the machine and appurtenances, was as follows:

The machine, with pump and accumulator	$31,500.00
Erection	4,000.00
Foundations and accumulator pit	4,083.77
Traveling crane	2,981 23
Steam pipes for heating building	439.52
Total	$43,004.52

The board had been convinced of the accuracy, and the durability, of the Emery weighing apparatus up to a few tons stress, but they were unwilling to risk the failure of so expensive a testing machine on this apparatus alone. So they added an independent weighing apparatus on the next best of the several plans submitted. This is the plan of Mr. Charles E. Emery—an excellent system, and vastly more accurate than any previously used, although much less sensitive than that of Mr. Albert H. Emery, the builder of the machine. It had long been suspected that the pressure of the fluid in the straining cylinder of a testing machine is sometimes very much higher than the pressure on the specimen, by reason of the friction of the piston packing, especially under great stresses. Mr. Chas. Emery demonstrated to the board that this packing friction could be so far overcome by revolving the piston by power, that it would move freely longitudinally, and that the fluid pressure in the cylinder would pretty accurately represent that on the specimen. A supplementary cylinder, on a carriage, was therefore placed between the straining cylinder and the specimen, and its piston was arranged to be revolved by the shafting before mentioned. The pressure per square inch in this cylinder would very nearly represent that per square inch on the specimen. But it was not an easy matter to construct a gauge which should perfectly measure even 3700 lbs. cylinder pressure per square inch. This, Mr. Albert Emery, however, accomplished on his reversed hydrostatic press system. Within the lower ranges of total pressure, these two weighing machines indicated so nearly alike as to prove that revolving the piston would show approximate accuracy of pressure, but at the higher ranges, so great was the packing friction that the heavy machinery provided would not revolve the ram. It now seems probable that this supplementary apparatus will not be regularly used, although it may readily be made heavier, and it will always be valuable to correct the readings of the other apparatus. It is certainly worth many times its cost in proving the worthlessness of hydraulic testing machines as heretofore constructed. The readings of the permanent weighing apparatus, as compared with those of the cylinder gauge when the piston was not revolving, showed in some cases an error of 40 per cent.

I regret that I cannot now refer to other extremely valuable features of this machine, on account of Mr. Emery's patents. The importance of a testing machine of great power cannot be overestimated. Constructors are beginning to find out that they have been led astray by predicating the physical qualities of large bars on those of smaller ones. One might almost as well exhibit a brick as the measure of the strength of a wall. The very first high stresses put upon this machine were a striking commentary on the error referred to. The link which broke at above 700,000 lbs. was sent out by the makers as "60,000-pound iron," but it broke at a little over 36,000 lbs. The bar which broke at above 430,000 lbs. was made of the very iron which, having endured above 50,000 lbs. per square inch in a 1-inch bar, broke at about 37,000 lbs. per square inch in a 5-inch bar turned down to 3⅛-inch.

But measuring the strength of large bars is not the only advantage of a large machine; it is equally important to determine the weaknesses of structures, and so to lead to the development of perfect forms. Given the strength of the individual pieces, it is impossible, for instance, to calculate the strength of a latticed column. But a testing machine that will take in a whole bridge post or a whole section of top chord, and subject it to a regularly increasing and measured stress up to the point of destruction—such a machine develops structural defects, as well as the physical qualities of materials.

Comparative experiments on similar specimens, to test the accuracy of other machines, have not yet been made. The fluid pressure in the straining cylinder and the knife-edge weighing machine, or ordinary scale, are the only other systems. However they may answer for small stresses, it is probable that they are, as heretofore constructed, totally indequate and misleading for great stresses.

The United States testing machine can apply 1,000,000 lbs. compressive stress to specimens of any length up to 30 feet. It can apply 800,000 lbs. tensile stress to links or specimens made so as to be held by pins of any length up to 37 feet. By a small addition to the machine, specimens not occupying more room than the straining link of the machine, can be tested up to about 45 feet length. The apparatus for transverse strains has not yet been applied, nor has the board had the means to supply many needed tools and instruments of precision for measuring the stretch of the specimen. Such, briefly, is the United States testing machine; an engine of power and precision, in which lie the possibilities of a revolution in the manufacture of iron, steel and bronze, and in the proportioning and adaptation of structures. I use the word possibilities advisedly; the immediate probabilities of such a grand work are not conspicuous, for the Congress of the United States has refused to furnish the money to make the machine available. It has refused to continue the board, and on the 30th of June next, according to law, the board will die. It has even removed the machine from the custody of the board to that of the Secretary of War. But it has done another thing; it has announced its own magnificent scheme for solving the problem upon which, more than on any other, the immediate improvement of structures depends—the improvement of bridges and ships and iron buildings and ordnance, and every kind of machinery. The scheme of Congress amounts to this—anybody can send his materials to the Watertown Arsenal and have them tested at cost, if there is anybody there to test them. Let us see how it will work.

There is a general call now for steel long-span bridges. Nobody knows, except approximately, the grade of steel required for the various kinds of stress, or the physical quality of bars of working sizes. Our knowledge of the strength of structures, such as built up top chords and columns of steel, is still more limited. If anything whatever is known about the results of tests, it is known that a few experiments would be inadequate, if not misleading. Hundreds of full-sized bars and members must be tested before such grades and forms can be determined as will approximate to the possible economy in bridge construction. This means the expenditure of many thousands of dollars. No bridge engineer, no bridge builder can afford such experiments, and it is unlikely that any railway or town corporation will undertake them. If an engineer does undertake them, he cannot spend the $50,000 or more necessary to get complete results, but the $5000 worth of testing he does buy is fairly his own. The next engineer spends another $5000 in substantially the same direction; the next spends another $5000 in a collateral line of investigation, and so on; and if a hundred engineers and corporations should thus spend half a million of money without an organized co-operation, they would be traveling the same ground over and over again, and three-quarters of the money would be wastefully expended.

If, on the contrary, the government should provide a tenth part of this sum—$50,000—to buy material and make structures and systematically test them, under the superintendence of a board of engineers representing the different branches of construction, and also the manufacture and manipulation of iron and steel, is it not probable that every one of the bridge builders and corporations in the country would get vastly better information, and that the whole science of construction would be at once lifted to a higher plane? And if twice this sum, which would then be paltry as measured by the results, were thus expended every year, might we not confidently look for revolutionary improvements in the following directions?

1. The intrinsically ridiculous factor of safety of six to one, half of which, at least, might be called the factor of ignorance—this enormous excess of material which loads down bridges with their own weight, and often exceeds the elastic limit of corporation finances—this dreadful incubus could be so largely removed that the same money would span twice the space.

2. Despite the so-called factor of safety, bridges tumble down every year, slaughtering hundreds of people and involving enormous expenses. The damages alone for the Ashtabula bridge disaster have already reached three quarters of a million dollars, and the case is not settled yet. Boilers also continue to explode and ships to spring aleak at mal-constructed seams. Machinery in vessels, on railways, in works of all kinds, breaks in pieces, killing, delaying, bankrupting; the floors of great factories and theaters plunge down among broken columns, torturing and killing men and women in their *débris*. Is it not probable that the tenth part of the money damages paid for these disasters, if expended in the means of prevention indicated—in the thousands of experiments which would establish a law of fabrication and construction—is it not certain that it would very largely reduce this record of bankruptcy and death?

3. What an enormous impetus a positive knowledge of the strength of metals and structures under working conditions would give to construction in old, and especially in new, directions; to manufactures and to general business. Engineers and mechanics naturally and properly employ the new steels and bronzes very sparingly and cautiously, until they know just what their physical properties are, and whether or not they can be uniformly produced. To supply this information, both to the makers and users of metals, by means of a comparison of chemical analyses with large-sized mechanical tests, is just what the present board had organized and successfully begun. But the Congress of the United States, the only body which can practically sustain such a system of experiments, does not feel authorized to spend money in this most helpful direction to the people of the United States. It can spend millions on stone forts and cast-iron guns, which are likely to afford the country a very limited defense, but it cannot prove the new metals, which, in the shape of armor, guns and shot, would be a defense indeed. It can lavish untold sums in digging channels for vessels up the creeks of the coast, but it virtuously refrains from squandering the public treasure to make a safe pathway for the locomotive. It can erect monuments and museums; it can dot the land over with public buildings, which, if they are not beautiful, are at least magnificently costly; but it recoils from violating the genius of republican institutions by ascertaining how to make even its own buildings safe and strong. It cannot divert the funds of the people from legitimate channels, such as private claims, in order to promote class interests, such as metallurgy and engineering, although above 250,000 tons of iron are put every year into the bridges on which the people travel—although a million dollars a day were spent during two prosperous years on the ironwork of American railways—although the government itself ordered 8000 tons of iron and steel supplies in 15 months in the one department of public buildings, not to speak of public defenses.

At the risk of wearying you with this subject, I feel it but just to the United States Board to give in this connection some account of its labors. The testing machine set up cost the government $35,000, but it cost the contractor over $100,000. The board was authorized to spend $15,000 for its own expenses; it did spend $2248.79. All the rest of the appropriation it devoted to a series of experiments which will be referred to. In addition to this, one committee of the board has collected and expended in experiments $1475, from iron and steel makers by passing round the hat. The three civilian members of the board, excepting the secretary, have never received any pay for their services, and I know that they are together out of pocket in this business more than $5000. The board has been warmly aided by many engineers and others interesetd in its work, but, in the struggle with the Congress of the United States, the professional societies and the metal makers and users of the country have not given that united personal aid upon which success can alone depend. The board has been embarrassed, and, finally, killed, by the misrepresentations of certain writers and Congressmen, and by the unfriendly action of other members of the government, not to speak of a general want of faith and interest in its labors. The very delay that corrected errors, developed improvements, and made the testing machine as perfect as it is, has been used as a powerful argument against the existence of the board; and this, despite the following well-known and significant fact: The United States Board appointed to learn the causes of the bursting of steam boilers, had an appropriation of $100,000. After spending $60,000 of it, the board reported that its results were entirely unreliable, because it could get no gauges on which it could depend. As an example, at Pittsburgh the gauges varied 150 lbs. on a pressure of 300 lbs. per square inch.

Meanwhile the Test Board has already made a large range of investigations, and worked out and tabulated the results. A part of these are already in print and will soon be distributed. A complete chemical laboratory has been set up at the Watertown Arsenal, and Mr. Andrew A. Blair, late chemist to the board, has made 213 complete analyses of irons and steels, and 249 of alloys. His report on his methods, already published, is a valuable contribution to science.

Commander L. A. Beardslee, U. S. N., has, with some aid from other members, completed and got into print the most exhaustive and important series of experiments ever made on chain cables, and on wrought iron generally. I had the honor, at the meeting a year ago, of presenting an abstract of these results to the Institute. The testing machine of the Navy Department was approximately adequate for these purposes. Over 2000 tests were made in this machine, besides a great number on piling, rolling and reheating in various iron works. It was proved for the first time that the strength of wrought iron, and its welding power by ordinary methods, are varied more by the amount of its reduction in rolling than by ordinary differences in chemical composition. The unsafety of the admiralty proof tables for chain cable was demonstrated, and new tables were prepared which will be of the highest value to the navy and to the merchant marine.

Prof. Thurston has made and worked up the most complete series of experiments on record concerning bronzes; they are accompanied by full analyses, and by an abstract of the preceding experiments at home and abroad on this subject. They are about to be issued with the above mentioned reports. The equally complete series on other alloys is nearly finished.

Chief Engineer David Smith, U. S. N., has made an elaborate series of experiments on tool steels. They are not yet fully worked up, because the Navy Department refused the request of the board to give him the necessary time. Actual tests by turning, boring, planing, slotting and chipping, were made on 70 bars from 11 American and 3 English steels of the best brands. These are accompanied by 108 tests of the steels in tension, torsion and compression, and by full analyses.

Gen. Wm. Sooy Smith has made, but not yet fully worked up, some important tests of beams.

Another committee of the board has nearly completed a preliminary series of experiments on structural steels; they are not expected to be exhaustive, but they will be of much value in practice, and of perhaps more value in pointing out the direction of further and large scale experiments, to determine the effects of chemical ingredients upon physical properties. One hundred and twenty-three specimens have been tested in tension, 190 in torsion, and 148 more are in hand. There are complete analyses of all the steels. These reports on alloys, tool steels, beams and structural steels will be presented to the next Congress, and will probably be published.

The other members of the board have rendered such services as they could, but the work of the committees which they have specially in charge could not be forwarded without money and apparatus.

One word for Mr. Albert H. Emery: To his engineering talent, mechanical culture and painstaking fidelity; to the patient devotion of all his energy, and more than all, his money, we are indebted for a marvel of invention, of development, of workmanship, of efficiency.

If the members of this Institute believe that the United States government ought to provide money to realize the great possibilities of this machine, and to revolutionize the constructive arts, they should vigorously, and above all things, unitedly, appeal to the next Congress to appropriate enough for thorough work, and to appoint a suitable mixed commission to superintend its systematic expenditure.

Glass Items.—It is said there is a prospect of Wheeling parties erecting a glass works in Wellsburg, W. Va.——Eight pressed glassware factories on the South Side, Pittsburg, are now in operation, and three are in idleness.——The National Glass Works, of Bellaire, employs 150 hands, with a weekly pay-roll of about $1200, or $64,400 a year. This company made, during the year, $90,000 worth of glassware.

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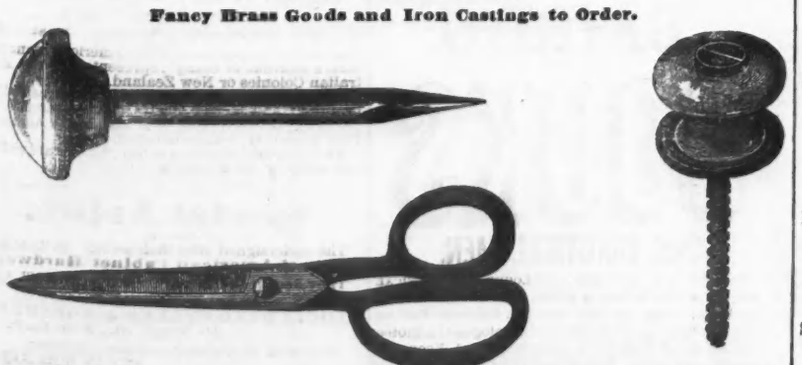

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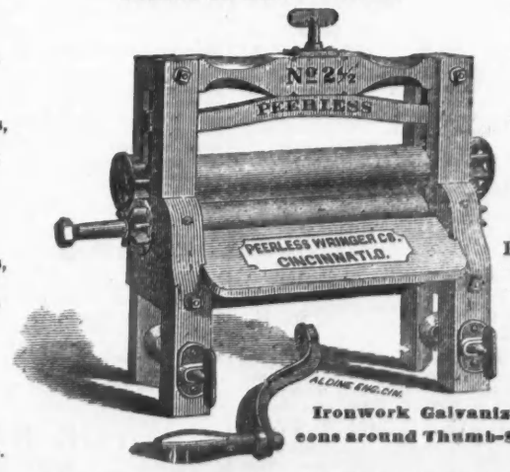

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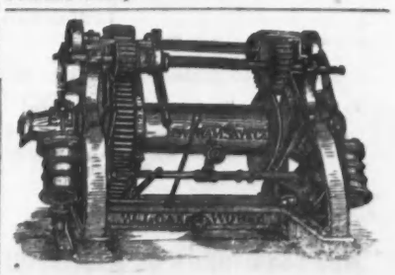

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Labor and Wages.

The Philadelphia and Reading Railroad Co. have decided on another issue of scrip to pay their workmen the amount due for wages in January. They have redeemed $700,000 of the $900,000 issued for the wages of September, October and November, which has interfered to that extent with their cash receipts. The scrip is at par, and the business men of the section through which the line runs, without exception, promise to continue to receive it as cash.

President Gowen, it is stated, has refused to stop production. He is reported to have said: "I would vote for an advance of prices, but under no circumstances would our company consent to a stoppage of shipments, as we have plenty of orders for all the coal we are moving, and I could see no reason, therefore, why we should stop production; and, apart from this, I had promised the workingmen in our employ steady work for the year, and I did not think it would be proper for us to stop our collieries so long as we had a market for the product."

There is talk of a convention of pressed glassware workers to be held in Pittsburgh before long. It is said that the entire industry of the country engaged in this branch will be represented.

The miners at Clark's Slope, near Bridgeville, Pa., have commenced to work at three cents.

A Steubenville, Ohio, correspondent of the Pittsburgh *Telegraph*, writing under date of February 17, says: The coal mines at the Averick shaft squared up their places on the 10th, preparatory to a strike, but finally agreed for 56 cents per ton, an advance of 6 cents. At the Swift shaft they are putting on more hands, receiving 60 cents per ton, and shipping their coal on the river. All the other shafts are working steadily and regularly.

An Old Landmark Changed.—Old merchants will observe, not without some feeling of regret, the partial demolition of the solid brick structure on Cliff street, known for so many years as the warehouse of Phelps, Dodge & Co. The northerly half is now wholly torn away, excepting the granite columns and cap-stone, containing the firm's name in gold letters. The section referred to was formerly filled with a stock of iron and tinplates, but business is now so largely done on through bills of lading, goods being landed on the wharf *in transitu*, that the need of extensive storage capacity no longer exists. The new structure will be equal to two stores of the ordinary capacity—to be known as "Phelps' Building"—and will be ready for occupancy this spring, as the main floor timbers and end walls will not be disturbed. The front will be of brick and stone, with ornamented cornices between each story and ornamented brick arches for every window. James Renwick is the architect. Among other tenants will be the Ansonia Brass Co., temporarily removed.

The two largest establishments in Iowa are the Eagle Manufacturing Co. and the Davenport Plow Co., the former making a specialty of cultivators, hay-rakes, cornstalk-cutters, sulky plows, &c., the latter making a specialty of plows.

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Wholesale Hardware Auctioneers,
83 Chambers and 65 Reade Sts., N. Y.

Sales held weekly for the trade. Consignments solicited. We refer to the leading Manufacturers and importers.

Special Notices.

SECOND-HAND TOOLS

One Putnam Gear Cutter.
One N. Y. S. Engine Co. Milling Machine, very heavy.
Two Wood & Light Milling Machines.
Two Brainard Milling Machines, No. 8.
One Brown & Sharp Universal Miller.
Three Lincoln Pattern Milling Machines.
One Smith & Garvin No. 3 Miller, new.
One Pond Index Milling Machine.
Three Smith & Garvin Hand Milling Machines.
One Pratt & Whitney No. 2 Milling Machine (Lincoln).
Two " " " Screw Machine.
One each Pratt & Whitney 2, 3, 4 Spindle Drills.
Two 4-Spindle Drills.
Four Sensitive Drills, drills to 3-16 in. hole.
One 20 in. Upright Drill.
Two 2-Spindle Profile Machines.
One Ames Jigging Machine.
One Engine Lathe.
One " " 24 in. x 24 ft., nearly new. Pond.
One " " 20 in. x 12 ft., new.
One " " 18 in. x 8 ft., New Star Tool Co.
One " " 16 in. x 8 ft., new.
Two " " 16 in. x 4 ft., good order.
One " " 15 in. x 4 ft., good order. Fitchburg.
One " " 14 in. x 5 ft., nearly new.
One " " 12 in. x 5 ft. Gould.
One " " 12 in. x 5 ft. Ames.
One " " 7 in. x 36 in.
Ten Hand Lathes, from 7 to 15 in. Swing.
One Planer, 36 in. x 7 ft.
One " 30 in. x 7 ft., new. Stover.
One " 27 in. x 7 ft., nearly new. Whitcomb.
One " 24 in. x 5 ft., good order. N. Y. S. E. Co.
One Crank Planer, 24 in. stroke.
Two Shaping Machines, 8 in. stroke, cheap.
One " " 5 in. " W. C. & Co., new.
One " " 15 in. " Hendey, new.
Two " " 24 in. " "
One Sellers' Bolt Cutter. Cuts to 1¼ in.
One No. 2 Schlenker Bolt Cutter, new. ¾ to ¼ in.
One No. 6 Wilder Punch and Shear, new.
One No. 2 " " Press, new.
One Large Foot Press, cheap.
One No. 5 Stiles Press.
26 in. x 60 in., Corliss Hor. Engine.
32 in. x 72 in., " Beam Engine.
18 in. x 42 in., Hewes & Phillips' Hor. Engine.
18 in. x 36 in., Fishkill Landing Machine Co. Engine.
16 in. x 48 in., Double Valve Hor. Engine.
16 in. x 42 in., Norwalk Hor. Engine.
16 in. x 42 in., Greene Cut-off Hor. Engine.
16 in. x 40 in., Ames Hor. Engine.
14 x 30 " Adj. Cut-off Valve Engine. Whitehill & Smith.
10 x 24 " Fishkill Landing Engine.
10 x 24 " Harris Corliss Valve Engine, new.
One 10 H. P. Baxter Engine.
One 4 " N. Y. Safety Power Co. Engine.
One 40 " " " Hor. Boiler.
One 25 " Vertical Hor. Boiler.
Lot Shafting, Pulleys and Belting.

E. P. BULLARD,

14 Dey Street, New York.

SALE AT PUBLIC AUCTION.

For account of whom it may concern, will be sold in
NEW HAVEN, CONN.,
on
THURSDAY, MARCH 6th, 1879.
At 2 o'clock p. m., at JUDSON'S PACKING HOUSE, Winchester Avenue,

That portion of the submerged cargo of the Steamship "*JOHN BRAMALL*," (wrecked Oct. 18 last on Little Gull Island, Long Island Sound) now stored in above warehouse, consisting of *14,148 Packages* shipped as containing each *1330 Primed Martini-Henry Brass Cartridge Shell*, or 30 pounds, and *8913 Packages* shipped as containing each *2000 Lead Patched Martini-Henry Bullets*, or 140 pounds more or less, all of which have been submerged in salt water for various periods of time. These articles will be sold in lots of 1000 cases, with the privilege of the entire quantity to the highest bidder for cash. Nothing guaranteed but the weight.

O. F. WINCHESTER,
Agent Imperial Ottoman Gov't.

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Opens for the reception of goods **August 20th.**
Opens to the public **September 10th,** and continues open until **October 11th,** in the

NEW PERMANENT BUILDINGS

Erected for the purpose.

Machinery Tested and fully Reported upon.

Send for Rules and Premium Lists after April 1.

H. McCOLLUM, Secretary.

Business Wanted

By a party with $10,000 to $25,000 to invest. Has a good knowledge of the Hardware trade. Can furnish best of references as to ability and integrity. Manufacturing preferred.

Address in confidence, giving particulars,
"C,"
Office of *The Iron Age*, 83 Reade St., New York.

For Sale.

Hardware and House Furnishing Goods Store, in Passaic, N. J. Best corner in the city and doing a good business. Will bear thorough investigation. Satisfactory reasons given for selling. A rare opportunity for a party with small means.

Address H. T. LYNCH,
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An old-established, energetic Commission House, having connection with all the principal jobbing Hardware Trade, and actively canvassing the whole country, is desirous of representing one or or two additional manufacturers for the sale of Goods upon commission.

Liberal arrangements will be made with parties having desirable lines of goods.

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A fine Hardware Store, Plumbing and Gas Fitting Shops, doing a fine business. Oldest stand and best located in the village. Satisfactory reasons given for selling.

Inquire of or address
JOSEPH G. COOKE,
Saratoga Springs, N. Y.

Would refer to the Russell & Erwin Mfg Co., New York City.

SUPERINTENDENT and MANAGER wanted for a Stove Foundry in successful operation. He must be familiar with all the various departments of Molding, Mounting and Pattern Fitting, and capable of organizing and successfully managing 200 to 300 employees. Address FOUNDRYMAN, care of Geo. P. Rowell & Co., New York, giving references and stating what salary will be expected for first year.

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OF
ORES, WATERS, FERTILIZERS, COALS, &c.
P. T. Austen, New Brunswick, N. J.

Special Notices.

New & Second-Hand Tools FOR SALE.

February List, No. 2

The following are all new tools to be sold very low, and are all Wood, Light & Co.'s make:

Four Engine Lathes, 16 in. swing, 6 ft. bed.
Two Engine Lathes, 16 in. swing, 8 ft. bed.
One Engine Lathe, 20 in. swing, 20 ft. bed.
One Engine Lathe, 28 in. swing, 24 ft. bed.
Three Planers, 24 in. x 24 in. x 4 ft.
Two Planers, 24 in. x 24 in. x 6 ft.
One Planer, 36 in. x 36 in. x 12 ft.
Two Shaping Machines 8 in. stroke.
Three Shaping Machines, 11 in. stroke.
One Shaping Machine, 14 in. stroke
Two No. 1 Bolt Cutters.
Seven No. 2 Bolt Cutters.
One No. 1 Bolt Cutter, with centers.
Five No. 2 Bolt Cutters, with center.
One No. 1 Milling Machine.

The Tools in the following list are all of Wood, Light & Co.'s make, have been used, but are all in good order and will be sold very low:

Five Engine Lathes, 15 in. swing 6 ft. bed.
Six Engine Lathes, 20 in. swing 7½ ft. bed.
Five Engine Lathes, 20 in. swing, 8 ft. bed.
One Engine Lathe, 21 in. swing 6 ft. bed.
One Engine Lathe, 21 in. swing 16 ft. bed.
One Engine Lathe, 24 in. swing 12 ft. bed.
One Engine Lathe, 28 in. swing 12 ft. bed.
Two Upright Drills, 27 in. swing, not geared.
One Upright Drill, 22 in. swing, not geared.
One Upright Drill, 32 in. swing, back geared and self feed.
One Planer, 24 in. x 23 in. x 4 ft.
One Planer, 24 in. x 24 in. x 4 ft.
Two Planers, 32 in. x 30 in. x 8 ft.
One Planer, 32 in. x 30 in. x 10 ft.
One Planer, 37 in. x 37 in. x 10 ft.
One Planer, 42 in. x 36 in. x 15 ft.
One Planer, 72 in. x 66 in. x 24 ft.
One Shaping Machine, 12 in. stroke.
Four Bolt Cutters, various sizes.
One Horizontal Boring Lathe.

Also the following miscellaneous Tools:

One Portable Engine, 6 in. cylinder.
One Hand Milling Machine.
One "Pond" Index Milling Machine.
Three Chase Patent Pipe Cutting Machines.
Three Engine Lathes, 13 in. swing, 6 ft. bed.
Two Engine Lathes, 22 in. swing, 8 ft. bed.
One Engine Lathe, 15 in. swing, 6 ft. bed. One Engine Lathe, 15 in. swing, 7 ft. bed. Three Engine Lathes, 20 in. swing, 8 ft. bed. Six Turning Lathes, 14 in. swing, 4½ ft. bed. Three 4-spindle Drills. One 8 in. Shaper. One Gear Cutter. One new "Hardaway" Bolt Heading Machine, to head up to ¾ in. bolts. One new "Hardaway" Bolt Heading Machine to head up to 1½ in. bolts. A lot of Saw Tables and Wood Working Machinery.

Please specify which of the above tools you want and we will forward all particulars.

The above tools will be sold very low, and can be seen at

The Geo. Place Machinery Agency,
121 Chambers and 103 Reade Sts.,
NEW YORK.

Leigh's Tables of Mercantile Discounts

(5 % to 82½ % and all the combinations.)

Arranged in three parts:
I. Comparative Discounts.
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Parties desiring a reliable, comprehensive and practical work on *compound discounts*, are invited to examine the plan of this book. Specimens of the different parts will be mailed *free* upon application to the author *at St. Louis*. The *book* mailed postpaid to any address for $1. Address

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R. & T. A. ENNIS, St. Louis.

RESIDENT BUYER.

The undersigned, having had 14 years' experience in the Hardware trade—10 years in the wholesale and 4 years in retail trade—would act as resident buyer in New York for any out of town house or houses entrusting their orders to him. Is conversant with the Paint, Oil and Glass trade, and having had experience as a buyer for New York wholesale houses, considers himself competent to buy for out of town parties. Will attend to purchasing, forwarding and insurance of merchandise. All goods bought at headquarters, and special attention paid to orders for odd articles. Office and desk room at the service of correspondents when in the city. Correspondence invited as to facilities, commission or salary. The advantages in obtaining five or six correspondents are obvious, both as to reduced expenses and purchase of goods in large quantities. Unexceptionable references as to character and ability. Address BUYER,
Office of *The Iron Age*, 83 Reade St., N. Y.

WANTED.—A position of any kind in a wholesale manufacturing or large retail hardware house, by a young man of 11 years' experience. Is capable of taking charge of almost any branch of the business, and can give satisfactory references; or would represent out-of-town manufacturers and sell goods to the trade on commission in New York and vicinity.

Address K.,
Office of *The Iron Age*, 83 Reade St., New York.

To Manufacturers and Capitalists.

FLOWER PINS, new article of light wire, recently patented. First patent of its kind. Owing to the competition to obtain the American patent, I offer it at private sale to the highest cash bidder, whose bid is received before 10 o'clock p. m. on the 28th day of Feb., 1879. Bids can be sent by letter or telegraph, prepaid, no postal cards. Price, terms and all necessary information as to invention sent on application to responsible parties desiring to compete. Address, J. H. PLUMMER,
1276 Pacific street, Brooklyn, N. Y.

Wanted—Iron Fence Maker.

A man who is thoroughly acquainted with manufacturing Wrought Iron Fence and ironwork of all descriptions, such as Shutters, Gratings, Balcony Work, &c., and capable of taking charge of a business employing a large number of men. None but those who are thoroughly acquainted with the business, of good habits, and can give the best of references, need apply. Address,
MANUFACTURER, Detroit, Mich.,
Care Carrier No. 3.

Hardware Business for Sale.

An old-established business in Hardware and Stoves, in one of the best river towns of Iowa; present stock about $7000. None need apply except those having sufficient capital, as business will sustain a much larger stock and prove profitable. Satisfactory reasons given for selling out.

Address, A. B.,
Office of *The Iron Age*, 83 Reade Street, N. Y.

FOR SALE.

STOCK OF

Saddlery Hardware.

It is in good, clean shape, and well located for business. Will sell on easy terms, or will exchange for heavy hardware. Address,
D. R. PAIGE, Akron, Ohio.

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(Published by the author.)

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The **Discount** or **Net** on any amount of dollars and cents, from a penny to one million dollars, can be ascertained in a few seconds entirely by **Addition.** Just the thing for **making** or **proving invoices,** finding **Net Value** of goods bought or sold, and comparing different Discounts, thereby saving time, blunders and **Headwork.**

Shows at a glance either the **Discount** or **Net** of $1.00, with any combination.

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We find them correct and wonderfully "labor-saving." SARGENT & CO.

94 Chambers St., NEW YORK, 1878.
We find everything "O. K.," and consider it of great use in our office work. SPENCER & UNDERHILL.

TOLEDO, O., April 15, 1878.
Mr. S. H. Jennings—DEAR SIR: Your Discount Tables are received, and I think are all you claim for them, and that they will be appreciated by the trade. I have had inquiries from customers for something of the kind, and shall be pleased hereafter to recommend your book. Yours, very truly,
T. W. ROOT,
with the Russell & Erwin Mfg. Co.

HOT SPRINGS, ARK., April 10, 1878.
We find the Tables correct, and are highly pleased with it. Every merchant should have one of them.
FONES BROS. & CO.,
Hardware Merchants.

NEW LONDON, CONN., Oct. 5, 1878.
We have used your Discount Tables during past nine months and find them of great help to us in our business.
DUDLEY, STEVENS & CO.,
Dealers in Carriage Stock Supplies.

NEW ALBANY, IND., April 23, 1878.
Mr. S. H. Jennings—DEAR SIR: Please let us know if we can procure "Jennings's Combination Discount Tables" in any city near here. We wish to examine it previous to purchasing. If you would like to send it C. O. D., you paying charges, with privilege of examination before taking, you may send one.
Yours truly,
TERSTEGGE, GOHMANN & CO.
National Stove Works.

NEW ALBANY, IND., April 30, 1878.
Mr. S. H. Jennings—DEAR SIR: Your book received by mail. We like the Tables very much. Enclosed find three dollars. Please acknowledge receipt.
Yours truly,
TERSTEGGE, GOHMANN & CO.

For the purpose of more quickly introducing the work, the publisher proposes, until **April 1st,** to send a copy (Counting-House Edition, price, $3.00), postpaid, to any address on receipt of

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At that time the price will be advanced so as to afford a moderate profit. **Merchants, Manufacturers, Bookkeepers** and **Clerks** now is your time. Send in your **Dollar** and receive the book by return mail.

Currency may be sent by **mail** at publisher's risk. Address

S. H. JENNINGS,
Deep River, Conn.

Hardware Business for Sale.

A well-established business in a prosperous town in Michigan, good agricultural surroundings. A very desirable opportunity for man of moderate means. Stock in first-class order. Present inventory about $6000. The very best of reasons for selling.

For full particulars address
U. W. L.,
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For Sale.

Valuable manufacturing property, Foundry and Machine Shop, capable of producing the heaviest work. Large yard room. A good wharf and railroad connection by spur track. Situated at South Norwalk, Conn. Terms reasonable.

E. HILL, Trustee.

IMPORTANT NOTICE.

The Iron Works property of the

Buffalo Iron and Nail Company,

located at Buffalo, N. Y., one of the most complete establishments in the United States, is now offered for lease for five to ten years, on the most liberal terms. Apply for proposition or catalogue to P. P. PRATT, of Buffalo. Here is offered an opportunity for co-operative organization, where the capital invested can be kept active, and not permanently invested in real estate.

Offices, Lofts and Store to Rent

At very moderate rates. Particularly desirable for the Metal, Iron and Hardware trades. In buildings extending from John to Platt street, opposite Cliff street, within one block of Fulton Street Station Elevated Railroad.

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Founded by Mathew Carey, 1785.

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Our new and enlarged CATALOGUE OF PRACTICAL AND SCIENTIFIC BOOKS, 96 pages, 8vo; a Catalogue of Books on DYEING, CALICO PRINTING, WEAVING, COTTON and WOOLEN MANUFACTURE, 4to; Catalogue of a choice collection of PRACTICAL, SCIENTIFIC and ECONOMIC BOOKS 4to; List of Books on STEAM AND THE STEAM ENGINE, MECHANICS, MACHINERY and ENGINEERING, 4to; List of Important Books on METALLURGY, METALS, STRENGTH OF MATERIALS, CHEMICAL ANALYSIS, ASSAYING, etc., 4to; two Catalogues of Books and Pamphlets on SOCIAL SCIENCE POLITICAL ECONOMY, BANKS, POPULATION, PAUPERISM and kindred subjects, sent free to any one who will forward his address.

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Issue Licenses to use the Process for the Manufacture of Iron and Steel

In the Bessemer Converter, Crucible, Siemens Martin, Puddling, Blast and Cupola Furnaces.

The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working.

See page 17 of *The Iron Age* of Oct. 25th, 1877.

Price Books.

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" " Half "		10.00
Pocket " Full "		5.00

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The valuable property known as

The Boonton Iron Works,

at Boonton, Morris County, N. J.,

on the line of the Delaware, Lackawanna and Western R. R. and the Morris Canal, giving ample facilities for transportation east or west.

THIS PROPERTY CONSISTS OF

Two Blast Furnaces, steam and water-power, with all modern appliances. Capacity, 25,000 tons of metal per annum.

Puddling Mill, containing 12 double puddling and two scrap furnaces. Capacity, 400 tons bars per week.

Plate Mill, with five heating furnaces and two trains of rolls.

Nail Factories, containing 150 machines.

Store House, with storage capacity for 50,000 kegs nails.

Keg Factory, with machinery to produce 300,000 kegs per annum.

Machine Shop, Carpenter and Plumbers' Shops, Foundry, &c.

All necessary machinery and appurtenances, driven by ample and unfailing water-power, and with exceptional advantages for coal, ores, and transportation of production. All the above in excellent order, and ready for work.

For sale on favorable terms.

Apply to **CROCKER BROS.,**
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A San Francisco firm of File and Tool makers having an agent constantly traveling among the consumers in the State and West Coast, is desirous of representing some first-class Eastern Houses in the manufacturing hardware trade.

Address **AGENCY, 248 Beale St.,**
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Freight forwarded to all ports in New Zealand. Also to Melbourne, Sydney, Adelaide and Brisbane in Australia. Cash advances made on approved consignments. For freight or passage apply to R. W. CAMERON & CO., 23 South William St., N. Y.

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Job Lots and Bankrupt Stocks Hardware.

Great bargains offered to the trade.

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To Steel Manufacturers.

An energetic young man with scientific training, who has had experience in the manufacture of Bessemer and Crucible Steel, in preference to remaining unemployed would be willing to take a subordinate position with the prospect of being employed as blower in Bessemer or as melter in Siemens-Martin steel works. Highest recommendation as to integrity, character and ability furnished. A correspondence, which shall be strictly confidential, respectfully solicited.

Address A. I. S.,
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Wood-working Machinery, Steam Engines, Automatic and Variable Cut-off and Throttling Steam Engines, Boilers and Steam Pumps, Machinist Tools. Large stock on hand.

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Request correspondence with American manufacturers desirous of being represented in the Australian Colonies or New Zealand.

Consignments solicited and prompt attention promised, and 60 day drafts against same for 50 per cent., through Bank of British North America, New York City, will be honored.

All the principal points in the Colonies are visited regularly by our travelers.

Special Notice.

The undersigned offer their services as Agents to makers of **American Cabinet Hardware.**

They keep a full line of UPHOLSTERERS' AND CABINET MAKERS' MATERIALS.

LOUIS WINDMULLER & ROELKER,
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Address in FRANKFORT-ON-MAIN, GERMANY,
ERWIN ROELKER.

EXCHANGE.

Will exchange for stock of hardware, a fine farm of 277 acres in Loudoun Co., Va., on W. & O. R. R., 25 miles from Washington, having a large, commodious house, barn and out buildings, all new; sixty acres good oak timber, balance meadow, pasture and tillage; stream of running water, 400 assorted fruit trees (all grafted), 120 bearing grape vines, small fruits, &c. Address J. M. H.,
1629 10th St., N. W., Washington, D. C.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, Feb. 26, 1879.

The rapid progress of the refunding operations of the Treasury continues without abatement. Since our last review, $20,000,000 of 4 per cents have been sold, and an equal amount of 5-20s called, making the total amount called for redemption since January 1st, $250,000,000. The general condition of the financial markets is very satisfactory. Money is a trifle firmer, and call loans were made as high as 6 %, with 3 @ 4 % as the ruling rates. The discount rate in prime business paper is 3 @ 5 %.

In the stock market the speculative activity noted for some weeks past has ceased, and a smaller volume of business is reported. The leading stocks have been Union Pacific, Northwest, Lake Shore, St. Paul and the coal stocks. We give below the closing quotations of stocks on the active list.

The bond market is strong for governments, with a good demand in the Eastern markets for some of the issues which, in view of the Treasury operations, have declined below their intrinsic value. Railroad investment shares are strong and in good demand. We give below the closing quotations of governments.

The bank return shows a decrease of $2,863,850 in surplus reserve, which now stands at $9,212,650, against $13,633,750 at this time last year, and $16,760,400 at the corresponding period in 1877. The loans show a decrease this week of $179,500; the specie is down $128,200; the legal tenders are decreased $2,957,800; the deposits other than United States are down $888,600, and the circulation is decreased $62,900.

The following is an analysis of the bank totals of this week compared with last week:

	Feb. 15.	Feb. 21.	Comparisons.	
Loans	$244,186,500	$244,007,000	Dec.	$179,500
Specie	18,059,500	17,931,300	Dec.	128,200
Legal t'nd'rs	48,364,800	45,317,000	Dec.	2,957,800
Tot. reserve.	66,394,300	63,308,300	Dec.	3,086,000
Deposits	217,271,200	216,382,600	Dec.	888,600
Reserve required	54,317,800	54,095,650	Dec.	222,150
Surplus	12,076,500	9,212,650	Dec.	2,863,850
Circulation.	19,398,800	19,335,900	Dec.	62,900

The foreign trade movements for the week are shown in the following tables:

IMPORTS.

	1877.	1878.	1879.
Total for week.	$5,253,264	$5,456,383	$6,813,985
Prev. reported..	41,171,167	37,815,377	37,747,233
Since Jan. 1....	$46,424,432	$44,271,760	$44,561,218

Included in the importations are articles valued as follows:

	Quantity.	Value.
Brass goods	12	$1,889
Bronzes	4	493
Cutlery	138	38,229
Guns	47	10,489
Hardware	3	1,047
Iron, pig, tons	300	3,864
Iron, sheet, tons	22	1,762
Iron tubes	70	706
Iron, ore, tons	352	787
Iron, other, tons	836	18,898
Metal goods	86	9,439
Needles	7	5,684
Old metal	.	434
Platina	1	6,242
Percussion caps	1	249
Saddlery	3	278
Steel	1,119	13,959
Silverware	2	335
Silver ore	34	2,788
Tin, bxs	16,166	70,433
Tin, 4746 slabs	259,228	39,161
Wire	83	2,952

EXPORTS, EXCLUSIVE OF SPECIE.

For week ended February 23:

	1877.	1878.	1879.
For the week...	$4,314,520	$7,313,838	$6,382,485
Prev. reported..	38,560,598	45,133,088	41,603,566
Since Jan. 1....	$42,875,118	$52,446,926	$47,986,051

EXPORTS OF SPECIE.

For the week ended February 21:

Total for the week	$282,613
Previously	1,858,827
Total since January 1, 1879	$2,141,440

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. Currency 6's	121½	122
U. S. 6's 1881 registered	106⅝	106⅞
U. S. 6's 1881 coupon	106⅞	106⅞
U. S. 6's 1867 reg	102	102¼
U. S. 6's 1867 cou	102	102¼
U. S. 6's 1868 reg	102¾	103
U. S. 6's 1868 cou	102¾	103
U. S. 10-40 reg	102	102⅛
U. S. 10-40 coupon	104½	105
U. S. 5's 1881 registered	104⅜	104¾
U. S. 5's 1881 coupon	104⅜	104¾
U. S. 4½'s 1891 registered	105	105⅛
U. S. 4½'s 1891 coupon	106⅛	106⅜
U. S. 4's 1907 registered	100⅛	100¼
U. S. 4's 1907 coupon	100⅛	100¼

The following were the closing quotations of active shares:

	Bid.	Asked.
Atlantic and Pacific Telegraph	35¾	36¼
Canada Southern	55⅞	56⅛
Chicago and Northwest	56¾	56⅞
" " Pref	87¾	87¾
Chicago, Rock Island and Pacific	131½	132
Chicago, Bur. and Quincy	116¾	117
Col., Chicago and Ind. Central	5¾	6
Clev., Col., Cin. and Ind	41¾	42¾
Cleveland and Pittsburgh	82¼	83
Chicago and Alton	78	79
" " Pref	105	—
Delaware, Lack. and Western	50⅞	51
Delaware and Hudson Canal	40¾	41¼
Express—Adams	106¼	107
" American	49⅜	49⅞
" United States	48½	49⅛
" Wells, Fargo & Co	96½	100
Erie	25⅜	25½
Erie preferred	46¼	46½
Hannibal and St. Joseph	15	15¼
" " Pref	43	43½
Illinois Central	82	82¼
Kansas Pacific	17	18
Kansas and Texas	8¼	8¼
Lake Shore	70¼	70⅜
Michigan Central	87¾	88
Morris and Essex	83	83¼
Milwaukee and St. Paul	38¼	38⅜
" " Pref	82¾	82⅞
New York Central	116¼	117½
New Jersey Central	38¾	39
Ohio and Mississippi	11¾	11⅞
" " Pref	36	36½
Pacific Mail	13	13⅛
Panama	133	135
Quicksilver	12	13
" Pref	32½	35
St. Louis and Iron Mountain	15½	16
St. Louis Kansas City Northern	8½	8¼
" " " Pref	35½	35¾
St. Louis and San Francisco	4⅜	4½
" " " Pref	5½	5¾
Sutro Tunnel	3¼	3⅝
Union Pacific	72¾	73
Western Union Telegraph	102¾	102⅞
Wabash	21⅝	21⅞

GENERAL HARDWARE.

The present season promises to be one of unusual activity, judging from the favorable reports we hear on all sides regarding the current business. Prices, as a rule, are firm at our quotations, although in some lines, notably cast iron goods, the irregularities so frequently noticed still prevail.

In Foreign Hardware a good seasonable demand is reported, and prices are firm and unchanged.

Henry Disston & Sons, and Nicholson File Company have issued the circulars which we print below, announcing their intention to enforce the adoption of a uniform price for their files. Considering the fact that the price of files never was as low as at the present time, and that stocks in both manufacturers' and dealers' hands are exceedingly light, while the demand for these goods is, beyond question, active, there is every reason to believe that prices will rule firm during the current year. Very few files are now imported, although the wants of the country for such goods are larger every year.

HENRY DISSTON & SONS,
SAW, TOOL STEEL AND FILE WORKS,
Front and Laurel streets,
PHILADELPHIA, February 24, 1879.

To the Trade—GENTLEMEN: We desire to call your attention to the many cases in which parties have been cutting prices on files, and selling better than 35 per cent. discount. This pernicious practice, if continued, must result injuriously to the "entire trade." Having your interests alone in view, we respectfully and firmly request that you will not break prices, but in all cases strictly adhere to regulation prices and discounts. We ask your earnest co-operation with us in our efforts to "hold prices firm," and fully expect in future a strict compliance with our terms.

We are, very respectfully,
HENRY DISSTON & SONS.

TO JOBBERS OF NICHOLSON FILES.

Inasmuch as recent complaints have been made that our factory prices on Nicholson Files (viz., 35 per cent. discount from our list) are being occasionally undersold; thereby tending to create distrust and lack of confidence, not only in us as manufacturers, but in those dealers who are faithful to our, and we think, their own interest, *This is to give notice* that our conditions are not thus to be violated without compelling us to enforce the penalty provided for in our quotation, whenever the proper evidence shall come before us.

We wish also to say that our production is to be sold, and we claim the right, and shall most certainly exercise it, to make our prices as low as may be necessary to accomplish this result, and this irrespective of what other manufacturers may do, but we must appoint the time at which such changes are to be made, and must refuse to sell any person or party who feel called upon to assume this important responsibility for us.

NICHOLSON FILE CO.,
W. T. NICHOLSON, Pres't.
PROVIDENCE, Feb. 24, 1879.

The demand for Nails is more active than at our last writing, and prices remain as previously quoted, viz., 10d. to 60d., $2.10 @ $2.15, net.

At a meeting of the Atlantic States Nail Association, held in this city on Thursday last, the following resolution was adopted by all the members present:

Resolved, That the members of the Atlantic States Nail Association hereby agree to run their nail machines only three weeks in any one month, beginning the first day of April, 1879, and continuing until the first day of April, 1880. Excepting only, that those works which depend upon water-power, shall be permitted to run full time in any one month, provided they shall not run more than twelve weeks (of sixty (60) hours each) in each four months. Provided, also, that the nail manufacturers west of the Alleghany Mountains agree to the same limitation. No factory to run more than sixty (60) hours in any one week. This agreement to be binding when signed by all manufacturers.

The secretary was requested to obtain the signatures of the absent members, and on motion the meeting adjourned. The next meeting of the Association will be held March 20, 1879.

C. E. Jennings & Co., 98 Chambers street, New York, have been appointed agents for the Riverside Fork Mills, manufacturers of agricultural implements, Hay Forks, Cast Steel Garden Rakes, &c. The goods made by this concern compare favorably with any similar goods on the market, and are adapted to the requirements of the home and foreign trade.

We have received the following circular:

OFFICE UNION MANUFACTURING CO.,
NEW BRITAIN, CONN., Feb. 15, 1879.

Dear Sir.—We beg to inform you that at the annual meeting of this corporation, held on the 13th inst., the resignation of our former manager and treasurer, F. Warren Tuck, Esq., was tendered and accepted. Thanking you for your many favors in the past, and desiring a continuance of the same, we shall have a representative under our new management call on you at an early day. Awaiting your further commands, we remain,

Yours truly,
UNION MANUFACTURING CO.

A. J. Pickett, president and manager of Landers, Frary & Clark and vice president of Union Works, has been elected manager and treasurer.

Heaton & Denckla, Philadelphia, illustrate in their advertisement on the eighteenth page a Patent Anti-Window Rattler, for use on dwellings, cars, steamboats, &c. They say of it: "It is so simple in construction that it can be used on any window, and so complete that it will prevent the slightest shaking, no matter how great the jar or how old the sash." It is neatly finished in nickel, and does not interfere with raising or lowering the sash.

We take pleasure in calling the attention of manufacturers whose goods are not represented in this city to the advertisement signed "Commission," which appears among "Special Notices," on the opposite page. The advertisement is from a house of long and high standing, and is worthy the consideration of manufacturers desiring representation in New York.

Wallace & Sons, Nos. 89 Chambers and 71 Reade streets, have issued, under date of the 1st inst., their annual catalogue and price list. The book contains 91 pages, and is one of the most conveniently arranged catalogues that we know of. They invite particular attention to their Tension Bird Cages, which they claim excel in convenience, cleanliness, beauty and strength any similar goods on the market. Among the advantages claimed for this cage are the following: "Solder and rivets are not used in its construction; any part can be obtained in duplicate; the wires yield to blows, but are not bent, and are one-quarter the usual size, making the cage light and airy. Though apparently frail, it is of great strength; no bird can escape." A very important feature in this bird cage is an ornamental bath, attached to the cage bottom, and accessible from the interior, which is so arranged that splashings are caught. Speaking of this feature they say: "Nestled in the cage bottom, the bath seems secluded, which is very pleasant to timid birds. The shape of the cage bottom and arrangement of feed cups obviate all necessity of a screen to prevent 'scatterings,' and in combination with the bath, forms the cleanest cage in the world." They quote these goods at discount 30 per cent. from the following list:

Polished Brass Cages, complete with Swing Perches, Opal Bath and Feed Cups.

	Per doz.
Diameter, 7 inches	$36.00
" 8½ "	48.00

Their discount sheet, dated February 15, "subject to change without notice," contains the following quotations:

	Dis. per cent.
Brass Butts	60
" Ferrules	25
" Kettles	net
" and German Silver Checks	10
" Strainer Cloth	net
" Escutcheon Pins	30
Iron " "	30
Brass Extinguishers	50
" Plantation Lamps	20
Belt Studs	20&5
Baxter's Wrenches	20
Brad Awls and Tools	net
Bird Cages	30
Brass and Silvered Jack Chain	60
Iron Jack Chain	60&10
Brass Wire Cloth	30
Copper "	15
" Rivets and Burs	50
" Braziers' Rivets	20
" Tacks	50
" Nails	net
" Bottoms	net
" Sheet and Bolt	net
Cartridges, Rim Fire	60&10
" Central Fire	20&10
Primers	20
Dog Collars	30
" Collar Locks, with Key	15
" " " no "	33⅓
Scandinavian Dog Collar Locks, with Key	40
Hand Lamps	20
Lanterns, Hurricane	40
" Police	20
Lamp Wick	40
" Trimmers	net
Oilers, Tin and Zinc	60
" Brass and Copper	50
" Automatic	45
" Olmsted's	50
" Broughton's	50
Percussion Caps	net
Soldering Coppers	net
Stair Rods	55
" Plates, Brass	30
" " Zinc	20
Student Lamps	10
Spencer "	25
Sun Burners	20
Surprise Burners	20
Union Ratchet Burners	20

The catalogue is handsomely illustrated, is printed on heavy, tinted paper, and is provided with a marginal index.

Richardson Brothers, Newark, N. J., have issued an illustrated catalogue and price-list of the Saws and other Tools manufactured by them. They show a good assortment of Mill and Cross-Cut Saws, Handled Saws, Billet Webs and Framed Wood Saws, Plastering Trowels, &c.

The Wm. Cabble Excelsior Wire Mfg. Co., Brooklyn, E. D., and No. 43 Fulton street, New York, have issued, under date of 20th instant, the following price-list and discounts for Galvanized Wire Fencing and Galvanized Netting. Of the Galvanized Wire Fencing they say: "This fence is the cheapest, most durable, and in many respects the most desirable fence in the market. As a fence against cattle, sheep, goats, hogs, poultry, &c., it is superior to any other that can be put up at the same expense; it being made of galvanized wire, which prevents its rusting. This fence is adapted to sections of the country where timber is scarce, or where they are subject to heavy falls of snow, as it exposes so little surface for the wind to act upon that it is no obstruction to the drifting snow; consequently it is the best fence a railroad company can have. The large meshes are used for farm and R. R. fence, the small for garden, ornamental and other purposes."

PRICE LIST OF GALVANIZED FENCING.

	Per rod.
No. 1, 45 inches high	$3.25
No. 1½, 36 " "	2.75
No. 2, 30 " "	2.50
No. 2½, 24 " "	2.25
No. 3, 16 " "	1.50

Put up in bales containing 20 Rods.

PRICE LIST OF GALVANIZED NETTING.

Gauge of Wire before Galvanizing.	Cts. pr. sq. ft.
⅜ in. Mesh, made of No. 20	28¾
⅜ " " " 22	27
½ " " " 18	28¾
½ " " " 19	25¾
½ " " " 20	21⅞
⅝ " " " 22	19¾
⅝ " " " 18	19¾
⅝ " " " 19	18
⅝ " " " 20	16¼
⅝ in. Mesh, made of No. 22	14⅜
⅝ " " " 18	12½
⅝ " " " 19	10¾
⅝ " " " 20	9
¾ " " " 18	9½
¾ " " " 19	8½
¾ " " " 20	7½
1 " " " 18	8½
1 " " " 19	6½
1 " " " 20	6
1½ " " " 18	7¼
1½ " " " 19	6
1½ " " " 20	5¼
1½ " " " 18	6¼
1½ " " " 19	5¼
1½ " " " 20	5¼
1½ " " " 18	4½
1½ " " " 19	3½
1½ " " " 20	3¼
1½ " " " 18	3½
1½ " " " 19	2⅝
1½ " " " 20	2¾
2 " " " 18	3
2 " " " 19	2½
2 " " " 20	2⅜
2¼ " " " 18	3
2¼ " " " 19	2⅜
2¼ " " " 20	2¼
3 " " " 18	2⅜
3 " " " 19	1⅞
3 " " " 20	1¾
3¼ " " " 18	2⅛
3¼ " " " 19	1⅝

Put up in bales containing 150 running feet.

Trade Discounts.

Galvanized Fencing, by the bale	list less,	40 %
" " orders for 5 bales.	"	50 %
" Netting, by the bale	"	45 %
" " orders for 10 bales	"	50 %
" " " 50 "	"	55 %

The attention of manufacturers and the Hardware trade is called to the advertisement of the HP Nail Company, of Cleveland, Ohio, on page 37. In addition to Horse Nails, which this company is very successfully manufacturing under an improved process, they are now producing Wire Nails of all sizes and varieties, either of steel, iron or brass. It is a matter of some wonder that these Wire Nails, which are so extensively used in foreign countries in many branches of wood manufacture, have not a more general use with us. The Barbed Nail made by this company is claimed to have a holding power almost equal to a screw, and costs less than one-half the price. They can be driven as an ordinary nail. They are especially adapted to car-roofing and car-building, wagon-making, furniture and finishing purposes, cigar boxes, &c.; in fact, to all uses where the common nail is insufficient and the screw hardly necessary. They stand between the common nail and the screw. The superior facilities which this company have for large and cheap production will, it is expected, enable them to place their nails upon the market below the price of the imported nail.

IRON.

American Pig.—The condition of the Iron trade is in pleasant contrast to the gloom of a few months ago. On every hand we hear of encouraging signs of its speedy re-establishment on a solid and prosperous basis. No. 1 prime Lehigh Iron cannot be obtained in this market to-day under $18 cash, and there is no anxiety to sell even at that figure. The Thomas Iron Co., who have been, as our readers are aware, heavy sellers during the past 30 days, now decline business for future delivery at present prices. We hear of a great deal of inquiry for Iron in lots of 500 to 1000 tons, which will no doubt lead to considerable business when intending purchasers are satisfied that the slight advance now asked will be maintained. Sales are reported during the week of 2000 tons Thomas, in lots, at full figures. We quote: Foundry No. 1, $16.50 @ $18; Foundry No. 2, $15.50 @ $17; Gray Forge, $16.

Scotch Pig.—Sales of Scotch Iron are few, and trifling as to quantity. No arrivals have been reported during the week. We quote, nominally: Eglinton, $19.50 @ $20; Coltness, $22. There is no Glengarnock in the market.

Rails.—Sales in lots are reported of 7000 tons Steel Rails, for delivery during the year at full prices. We hear also of considerable inquiry. In Iron Rails no transactions are reported. We quote: Steel, at tide-water, $43 @ $44, and Iron at Mill $32 @ $36, according to section, quality, &c.

Old Rails.—Nothing has transpired in Old Rails worthy of remark since our last writing, and we continue to quote $20 @ $21 per ton here.

Scrap.—Sales are reported, during the week, of 125 tons No. 1 Wrought and about 150 tons Cast Scrap, both on private terms. We quote: No. 1 Wrought, from Yard, $20 @ $21; No. 1 Cast, $14 @ $14.50.

We have received the following circular, showing the action taken at the conference of Bar Iron manufacturers, held in Philadelphia last week. We are requested to announce that the committee appointed at that conference to revise the list of extra prices on Bars, would be very glad to have the views of rolling mill owners generally on this subject. All information and suggestions that will tend to aid in reaching a list that will be generally acceptable, will be thankfully received and duly considered. Letters may be addressed to W. E. S. Baker, secretary of committee, 122 Race street, Philadelphia, or to the chairman, Oliver Williams, Catasauqua, Pa.:

BAR IRON MANUFACTURERS' CONFERENCE,
PHILADELPHIA, February 22, 1879.

Dear Sirs:—In response to invitations recently issued, delegates from the leading Bar Iron Mills of the Atlantic States, met in the parlor of The American Iron and Steel Association, Philadelphia, on Friday, February, 21st, 1879, to interchange views as to the present condition of the trade.

Oliver Williams was called to the chair, and William E. S. Baker elected secretary.

The chairman explained the objects of the meeting in some pertinent remarks, and after reading telegrams and letters from parties who were prevented from being present, say, Buffalo, Berwick, Boston, Reading, Elmira, Fall River, Rome, Pottsville, &c., he requested each person present to report the condition of business in his locality.

The venerable David Thomas, on behalf of the Catasauqua Mill, gave his impression of the Lehigh Valley region. Pig Iron was largely sold ahead there, and was firmly held at from 50¢ to $1 a ton advance over the profitless prices recently ruling; while the mill was full of Bar orders, and they were refusing to enter future contracts at less than 1 95-100¢ per pound base for Bars. He regretted that want of unanimity on the part of mill owners had reduced the prices of extra sizes to their present condition, while neglect of harmonious intercourse had forced the price of refined Bars down to that of an inferior article, made from old rails or cinder Pig Iron.

Delegates from nearly all the mills, representing six States, substantially confirmed these remarks. They spoke of the firmness and advance in Pig Iron, and in some cases the scarcity of good brands for mill purposes. Nearly all were full of business, and were compelled to refuse large orders, and would sell no Bars under 1 9-10¢ ₰ lb, while some were asking 2¢.

Upon comparing notes carefully, no good reason could be assigned for the present irregular and ruinously low prices for extra sizes, except want of confidence and ignorance of each other's actions. It was shown that these extras had been so "cut" as to realize a positive loss to the manufacturer for several years past.

After full discussion of the question, on motion, the following resolutions were passed unanimously:

Resolved, That a committee of seven be appointed to revise the Eastern Schedule of Extra Prices for Bar, Rod, Band, Scroll, Oval, Hoop and other Irons, and to submit the same to the mill owners for final action, at a meeting to be called for that purpose.

Resolved, That the Committee on Revision be requested to confer with Bar manufacturers of the West, and other districts of the country, with a view to securing a uniform classification of prices for extra sizes.

The following gentlemen were appointed on the committee: Oliver Williams, Catasauqua, chairman; Percival Roberts, Pencoyd; W. O. Fayerweather, Passaic; Stephen Robbins, Philadelphia; James E. Walker, Troy; A. Pardee, Jr., Allentown; Wm. E. S. Baker, Duncannon, secretary.

Remarks were made by delegates from Richmond (Va.), Trenton, Wilmington, Altoona, Baltimore, Norristown, Duncannon, Port Clinton, Philadelphia and other places. But one sentiment prevailed: the unprofitableness of the past and the hopefulness of the future. It was clearly shown that stocks of both materials and finished iron were greatly reduced—that the general business of the country was improving—that with specie resumption, our enormous and increasing exports, the heavy Western and Southern crops, abundant and cheap money, added to the present and impending contracts for railroad, car and other industries, a largely increased business, upon a firmer basis, is assured for 1879.

After passing a resolution of thanks to the American Iron and Steel Association and its indefatigable secretary, James M. Swank, for courtesy and the use of their parlor, on motion the meeting adjourned, to meet at the call of the committee.

Respectfully,
OLIVER WILLIAMS, Chairman.
WM. E. S. BAKER, Secretary, No. 122 Race street, Philadelphia.

METALS.

Copper.—The market has been quiet and unaltered, sales being limited to 100,000 pounds Lake Superior at 15½¢. Baltimore may be nominally quoted at the same figure. There is no later telegraphic news from London. Mail advices have reached us from there to the 8th inst., containing the statistics for January. On Feb. 1 the visible supply in England and France was 52,978 tons, against 52,260 Jan. 1. Reducing ore, pyrites and regulus to fine Copper, the import into the United Kingdom in 1878 has been 86,067 tons, against 91,309 in 1877 and 77,323 in 1876, while the export has been 55,246 tons, against 50,726 and 49,884. The London *Mining Journal*, under date of Feb. 8, expresses itself to the following effect: "The charters for the last half of January were telegraphed as 2300 tons. This announcement was not calculated to encourage buyers to come forward freely, and sales could only be effected by accepting a reduction in price. The market at no time has exhibited any degree of activity, and notwithstanding the cheap rates at which Copper can now be secured, buyers are rather conspicuous for their absence; but although this naturally gives a dull aspect to the market, yet holders are by no means dismayed, and rather look forward to better times. A greatly diminished production in Chili and Australia is by many fully expected and asserted to in the most positive manner. The value of Copper is now so much reduced that it has reached a point at which it is barely, if at all, worth the while of many companies continuing to work their mines; and it must be pretty evident to producers generally, that the only way to give immediate relief to the market will be to considerably curtail supplies. The production has hitherto been too large, and out of proportion to the consumption. The only remedy under these circumstances is to temporarily lessen the output." Manufactured moves somewhat slowly for this season of the year. We quote combination prices as follows: New Sheathing Copper, 22¢; Braziers', 24¢, and Bolts, 24¢; Bottoms, 26¢; American Yellow Sheathing Metal, 13½¢; Yellow Metal Bolts, 20¢; and English Yellow Sheathing Metal, 12¾¢ @ 12½¢, currency, in bond.

Tin.—Our market remains steady, some large transactions having taken place, but particulars have been kept secret: We quote spot Straits, 14¾¢ @ 15¢; English Refined, 14½¢ @ 14¾¢; ditto Common, 14¢ @ 14¼¢, and Banca, 18¢ @ 18¼¢, all large lines. There is a fair jobbing trade. Arrivals this month have been about 7500 slabs Straits. The Hawthorne, for Boston, with about 1100 slabs, has been lost off

our coast. London cables £61 for Straits, and Singapore, $19.25 per picul. The visible supply in England and Holland on Feb. 1 was, according to French & Smith's circular, 18,729 tons, against 17,166 tons in 1878, and 15,057 in 1877; on January 1, 1879 it was 18,269. The January deliveries have been 1401 tons, against 1222 in December, 1608 in January, 1878, and 1269 in 1877. Toward the close we hear of later cables received from London, according to which Straits Tin is said to have advanced to £62. 10/ @ £63, English refined to £69, and Singapore to $20.50, with a rising tendency. If confirmed, it remains to be seen what effect this sudden improvement will have on our market. The *Tin Plate* market is firm and moderately active. We quote large lots, ordinary brands, per box: Charcoal Bright, $6.25 @ $6.50; do., Ternes, $5.87½ @ $6.12½; Coke Tin, $5.50 @ $5.62½; Coke Ternes, $5 @ $5.25.

Lead.—Very little business has been transacting during the week. We quote: Common domestic, 4½¢., and corroding, 4⅜¢. The limited character of late dealings leads to the supposition that ere long a larger business will take place, consumption going on steadily. Large estimates of the yield of Lead in the Leadville district, Colorado, for the current year, are again put forward. We should not be too sanguine in this respect, since Leadville still lacks railroad communication with the outside world. After this obstacle shall have been overcome, we do not deny that the large quantity eventually to be got from there may seriously affect the value of the metal. The following is from London, dated February 8: "Lead continues dull of sale, and without any material alteration as regards the demand or price, though the latter may, perhaps, be rather easier for small, and few orders are reported to have been executed as low as £13. 10/ for common English pig, and at about 5/ per ton more for the best brands. Sheet lead is procurable at £14. 10/ per ton, but in spite of this very low price few transactions are entered into." Manufacturers' prices remain unchanged, and we quote: Bar, 5½¢.; Pipe, 5½¢.; Sheet, 6½¢.; Tin-lined Pipe, 12¢.; No. 1 Solder, 10¢.; all less 10 ₹ cent. to the trade.

Spelter and Zinc.—A fair trade is doing in Domestic Spelter, in small lots, at 4⅜¢ @ 4¾¢. We quote: Refined, 8¼¢ @ 8¾¢; Silesian, 5¾¢, and Bergenport, from Lehigh ore, 9¢. Spelter is inactive, but unchanged, in England. *Sheet Zinc* is steady at 6⅜¢ @ 6½¢.

Nickel—Is sustained at $1.25.

Antimony.—The business in this metal is a restricted one, within the range of 11⅝¢ @ 12¼¢, according to quantity and brand.

OLD METALS, PAPER STOCK, &c.

Business in the Old Metal market continues as dull as it has been for the past month. During the week there has been an active demand for all Rag and Paper stock, and the prices are stiff at quoted rates.

The purchasing prices offered by dealers for Old Metals are as follows:

Copper, heavy	per lb.	$0.1	@	....
Copper Bottoms	"	.10½	@	....
Yellow Metal	₹ lb	.08½	@	....
Brass, heavy	"	.09½	@	....
Brass, light	"	.08	@	....
Composition, heavy	"	.11½	@	....
Lead, solid	"	.03¾	@	....
Tea Lead	"	.02¾	@	....
Zinc	"	.03¾	@	....
Pewter, No. 1	"	.10	@	....
Pewter, No. 2	"	.08	@	....
Wrought Iron	per ton.	$16.00	@	....
Light do.	"	9.00	@	....
Stove Plate	"	9.00	@	....
Machinery do.	"	11.00	@	....
Grate Bars	"	3.50	@	....

The prices current for Rags, &c., are as follows:

Canvas, Linen	per lb.	3 c.	@	3½c.
White Cotton, New	"	4½c.	@	....
" " No. 2	"	1½c.	@	....
White, No. 1	"	3¾c.	@	4 c.
" No. 2	"	2 c.	@	..
Seconds	₹ lb.	1½c.	@	....
Mixed, Woolen	"	2 c.	@	3 c.
Soft, do.	"	6½c.	@	7 c.
Gunny bagging	"	3 c.	@	....
Jute butts	"	2¾c	@	....
Kentucky bagging	"	3 c.	@	....
Book Stock	"	2½c.	@	....
Newspapers	"	1¼c.	@	1½c.
Waste Paper and Scraps	"	¾c.	@	....
Kentucky Bale Rope	"	4 c.	@	....
Tarred Shaking	"	1 c.	@	1¼c.
Grass Rope		....	@	2½c.

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending Feb. 25, 1878:

Hardware.

Ackerman J. H. & Co.
Antimony, cks., 13
Amsinck & Co.,
Guns, cs., 50
Cartridges, cs., 182
Baker & Hamilton,
Cases, 5
Baldwin Bros. & Co.
Mdse., p gs., 5
Berge J. & H.
Mdse., pkgs., 5
Bloomfield J. C. & Co.
Mach., pkgs., 37
Boker Hermann & Co.
Cases, 13
Cordova G. de,
Car wheels, 20
Boxes, 1
Eddy G. M. & Co.
Mdse., pkgs., 81
Erie & North Shore Railway Co.
Mdse., pkgs., 57
Hilger E.
Gun caps, cs., 4
Gun wads, cs., 7
Hopkins E. T.
Mdse., pkgs., 7
Merchants' Dispatch Co.
Spades, bdls., 26
Mitchell, Vance & Co.
Mdse., pkgs., 2
Moore's J. P. Sons,
Gun caps, cs., 4
Myers A. G.
Mdse., pkgs, 1
Rogers Lo'motive Works
Mach., bxs., 23
Schoverling & Daly,
Mdse., pkgs., 10
Singer Mfg. Co.
Mach., pkgs., 2
Stephani A. & Co.
Lead capsules, cs., 5
Watertown Steam Engine Co.
Mach., pkgs., 25
Wiebusch & Hilger Hdw. Co.
Gun wads, caps, cutlery & hdw., pkgs., 38
Wood S. A. Mfg. Co.
Mach., pkgs., 1
Order,
Gun caps, cs., 2
Order,
Antimony, cks., 42

Iron

Drexel, Morgan & Co.
Ore, tons, 481½
Henderson Bros.
Pig, tons, 100
Lang W. Bailey,
Bars, 231
Bundles, 20
Milliken & Smith,
Wire, bdls., 750
Order,
Bundles, 120
Spiegel, tons, 400
Spiegel, kilogs., 198,632
Ore, tons, 300

Steel.

Brown W.
Cases, 19
Bundles, 60
Sanderson Geo. & Co.
Bundles, 32
Order,
Casks, 21

Metals

Bank of Montreal,
Tin plates, bxs., 450
Brown Bros. & Co.
Tin slabs, 734
Bruce & Cook
Tin plates, bxs., 400
Byrne Jos & Co.
Tin plates, bxs., 808
Cort N. L. & Co.
Tin and terne plates, bxs., 2385
Meyer Moritz,
Lead, bars, 1042
Navarro y Munoz,
Silver, bars, pkgs., 1
Naylor & Co.
Tin plates, bxs., 1335
Phelps, Dodge & Co.
Tin plates, bxs., 12,968
Pornares & Cushman,
Old printing types, bxs., 9
Order,
Tin plates, bxs., 4018
Tin, slabs, 2629

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending Feb. 25, 1879:

Stockholm.

	Quan.	Value.
Slates, cs.	100	$1,000

Christiania.

Pumps, pkgs.	9	370
Ag. imp., pkgs	8	402

Stettin.

Ag. imp., pkgs	77	1,599

Copenhagen.

Slates, cs.	352	1,381
Hdw., cs.	20	224
Glassw're, pgs	1	20
Ag. imp., pkgs	17	797

Antwerp.

Ag. imp., pkgs	59	5,893
Pl'd ware, cs.	4	104
Copper, cks.	90	15,750

Hamburg.

Hdw., cs.	68	1,036
Cartridges, cs.	13	284
Bullets, cs.	6	90
Ag. imp., pkgs	244	26,310
Sil. pl't'd w're	2	315
Sew. mach., cs	59	1,524
Tinware, cs.	76	2,638
Lea. belt., bls	6	752
Revolvers, cs.	3	1,103
Mf. iron, pkgs.	52	660
Knit. mach., cs	5	875
G'dstones, pgs	6	100
Mach'y, cs.	4	800
Pet'm., gals.	262,910	23,662

Rotterdam.

Hdw., cs.	11	386
Bird cages, cs.	3	277

London.

Slates, pcs.	123,473	3,000
Ag. imp., pkgs	51	1,450
Mach'y, cs.	20	2,000
Hdw., cs.	45	700
Sew. mach., cs	67	1,203

Bristol.

Petlm., gals.	231,836	21,734

Gibraltar.

Petlm., gals.	10,000	1,300

Bremen.

Petlm., gals.	604,759	61,550
Hdw., pkgs.	66	1,904
Mach'y, pkgs.	11	250
Ag. imp., pkgs	161	3,739
Mf. iron, pkgs	4	250
Lea. belt., cs.	2	500

Liverpool.

Sew. mach., cs	23	402
Mach'y, pkgs.	33	1,997
Pl't'd ware, cs.	13	740
Metal g'ds, cs	23	2,570
Hdw., cs.	30	2,933
Pistols, cs.	2	900
Belting, bale.	1	244
Brass g'ds, cs.	5	288
Ag. imp., pkgs	404	8,140
Silverware, cs.	1	300
Slates, cs.	26	100

Glasgow.

Mach'y, pkgs.	5	510
Ag. imp., pkgs	16	1,179
Hdw., case	1	100

Hull.

Pumps, pkgs.	6	500
Ag. imp, pkgs.	103	15,100
Hdw., cs.	12	200

Exeter.

Petlm., gals.	40,849	4,373

British North American Colonies.

Ptlm., gals.	2248	385
Coal, tons	347	1,400
Hdw., pkgs.	91	1,009
S'dpaper, pgs.	2	16
Mf. iron, pcs.	234	105
Iron, pkgs.	7	40

British West Indies.

Petlm., gals.	12,223	1,582
Glassware, pgs	35	230
Mach'y, box	1	25
Hdw., pkgs.	12	433
C'ge mtls, bxs	3	85
Pl'd ware, cs.	1	50

British East Indies.

Ptlm., gals.	216,210	28,107

British Guiana.

Ptlm., gals.	5000	595

Dutch West Indies

Ptlm., gals.	503	62
Pl't'd ware, cs.	1	90

Havre.

Copper, cks.	223	43,903
Tubing, cs.	1	200
Ag. imp., pkgs	1655	82,473
Hdw., pkgs.	5	37
Silverware, cs.	1	1,100
Mach'y, pkgs.	68	1,134
Coal, tons	150	563

Marseilles.

Ptlm., gals.	201,919	18,264

Gijon

Ptlm., gals.	68,262	8,191

Alicante.

Ptlm., gals.	179,670	21,050

Amsterdam.

Ptlm., gals.	150,000	15,000

Ciaplatine Republic.

Ptlm., gals.	15,000	1,800

British Possessions in Africa.

Petlm., gals.	38,000	5,620
Hdw., pkgs.	12	327
Mf. iron, pkgs	47	350

Cuba.

Glassw're, pgs	76	2,101
R.R. mtls., pgs.	2213	11,062
Hdw., cs.	397	5,033
Coal, tons	591	2,296
Mach'y, cs.	28	1,337
Petlm., gals.	14,831	1,771
Ag. imp., pkgs	8	209
Mf. iron, pkgs.	135	1,311
Nails, kegs	282	524
Pl't'd ware, cs.	1	116
Sew. mach., cs	7	350
Grindstones	100	95

Porto Rico.

Nails, kegs.	25	73
Mach'y, cs.	2	73
C'ge mtls, pgs	15	82
Ptlm., gals.	10,000	1,194
Hdw., cs.	2	42

French West Indies.

Ptlm., gals.	1009	135

Mexico.

Glassware, cs.	126	1,576
Lead pipe, bdl	42	500
Nails, kegs.	27	75
Wire, pkgs.	12	108
Sew. mach., cs	19	853
Revolvers, cs.	4	1,751
Phonog'phs, cs	12	120
Cutlery, cs.	24	665
Tinware, cs.	2	57
Burners, case.	1	60
Tin plate, bxs	6	40
Pl't'd ware, cs.	16	1,426
Petlm., gals.	25,050	3,433
Pig iron, tons.	10	200
Mach'y, pkgs.	276	13,657
Iron pipe, pgs	550	98
Tacks, cs.	6	119
Guns, cs.	3	375
Hdw., cs	175	2,727
Pumps, pkgs.	6	60
L'mp g'ds, pgs	11	146
Cartridges, cs.	4	110
Mf. iron, pkgs	82	905
Arms, case	1	100
Packing, pkgs	2	13
Tel. mtls., pgs	3	68
Belting, case.	1	605

Alexandria.

Ptlm., gals.	120,000	14,500
Coal, tons	100	375

Hayti.

Petlm., gals.	2675	351
Glassware, cs.	5	88
Hdw., cs.	10	75

Argentine Republic.

Guns, case	1	300
Nails, kegs.	100	375
Ag. imp., pkgs	65	988
Pumps pkge.	1	60
Tinware, cs.	15	224
Hdw., cs.	13	174
Mach'y, cs.	6	160
Petlm., gals.	45,000	5,400
Sew. mach., cs	158	2,200
Irons, cs.	12	75
Mf. iron, pkgs.	10	55

United States of Colombia.

Gl'sware, pgs.	17	242
Saddlery, pgs.	12	324
Hdw., pkgs.	210	3,675
Petlm., gals.	4542	834
Carbines, cs.	1	78
Cutlery, cs.	94	1,985
Mf. iron, pkgs.	242	3,075
Pistols, cs.	2	420
Gun case	1	220
Gun metal, cs	3	267
Gas fixt., pkgs	105	2,300
Pumps, pkgs.	12	676
Sew. mach., cs	141	3,235
Revolvers, cs.	4	368
Cartridges, cs.	14	472
Mach'y, pkgs.	137	6,569
Pl't'dware, pgs	16	2,020
Nails, kegs	30	79
Iron, pkgs.	110	373
Zinc, cks.	7	275
Ag. imp., pkgs	12	525

Brazil

Petlm., gals.	107,615	13,431
Hdw., pkgs.	115	1,852
Mf. iron, pkgs.	14	83
Cutlery, cs.	14	389
Glassw're, pgs	20	397
Sew. mach., cs	7	150
C'ge mtl, cs.	5	225
Mach'y, pkgs.	13	244
Shoe nails, bxs	10	37
Nails, kegs	86	195
Burners, case.	1	20
Irons, cs.	106	686

China.

Guns, case	1	40
Hdw., cs.	16	345
Cartridges	3	75

COAL.

The feature of the market during the past week was yesterday's sale. Although 100,000 tons were sold, prices were very fairly sustained when all the conditions are considered. The sale was largely attended, and the Coal was in good demand. The Eastern markets were well represented, and obtained a fair proportion of the Coal. After the conclusion of the sale the market was very brisk, and large sales were made at the average of the auction sale. It is very generally reported in the trade that more business was done after the sale than ever before on the day of an auction since the auction sales were established, after the great break in the combination. In general, the prices obtained are the average of those made at the sale. The Pennsylvania Coal Co. have issued a circular quoting figures slightly below those of the auction, and less than those of its previous circular. Much surprise was felt in the trade at this course, but we think that the reply of one of the managers in answer to the question why this was done is sufficient. "The prices were made to enable us to move our Coal." In other words, it was not an attempt to break the market, but simply to find a price at which they could sell their Coal.

Mr. F. E. Saward sends us the following figures in regard to the sale:

The 162d Auction Sale of Scranton Coal.

6,000 tons of Steamer sold at an average of $2.25
25,000 tons of Grate sold at an average of... 2.28
20,000 tons of Egg sold at an average of.... 2.29
65,650 tons of Stove sold at an average of... 2.64⅝
7,000 tons of Chestnut sold at an average of 2.42½

Averages of Last Month's Sale.

Steamer	$2.35	Stove	$2.75
Grate	2.31⅞	Chestnut	2.39½
Egg	2.32⅞		

A fair proportion of the Coal went to manufacturers, although the bulk went to dealers for domestic purposes. The domestic trade in the city is good and prices are fairly maintained. The supply of Coal is fair and there is little or no delay in loading, yet we do not hear of any accumulation of Coal at any of the leading shipping points. The enormous demand for Chestnut Coal, caused by the introduction of base burning stoves at times greatly embarrasses trade, the demand for the single size being so great that it is hardly possible to supply it without overstocking the market with other sizes This state of things is likely to continue for some time longer as the number of base-burning stoves is constantly upon the increase.

PHILADELPHIA.

Office of *The Iron Age*, 220 South Fourth St.
PHILADELPHIA, Feb. 25, 1879.

Pig Iron.—The market continues firm, although there is scarcely as much inquiry as there was two or three weeks ago. This is only what may be expected, however, as the sales during the early part of the month were something entirely out of the ordinary course of business. There were also at that time inducements to purchase which do not exist to the same extent now. The requirements of buyers were large, prices were low and prospects of an advance imminent. The large consumers having supplied their wants on favorable terms, are for the present out of the market, and as prices are all the way from 50¢ to $2 ₹ ton higher, there is in the meantime no inducement to follow the advance any further. So far as we can see, there is no probability of a retrograde movement in prices, neither is it probable that any further advance will be made for the present. The improved condition of the trade is clearly proved, however, in the fact that all cheap outside lots have been picked up, a large portion of the furnace capacity engaged for the coming year, and sellers enabled to assume a position in which they can demand and secure an advance, as above named. It is also satisfactory to know that the purchases were for actual consumptive requirements, so that there is every reason to expect that stocks will be kept within moderate proportions, both at furnaces and in consumers' yards. The current demand from the smaller class of trade promises to be good, and upon this will probably depend the question of a further advance. Taking a careful survey of the whole field, the condition of the Iron trade seems to show further improvement since date of our last report. This may not be seen in quotations so much as in the gradual and thorough cleaning up of all outside lots, some of which have been a constant menace to the market. The removal of these is, therefore, an encouraging feature, and, so far as can now be seen, there is nothing to prevent a permanent and healthy business for some time to come. Prices are difficult to quote. Asking rates are higher, but it is doubtful if they are obtained to any extent, although it is reasonably certain that large lots could not be bought on as good terms as a week ago. We quote: $17.50 @ $18 for No. 1 Foundry, $16.50 for No. 2 Foundry, and $15.50 @ $17 for Gray Forge. Market firm. Sales have recently been made to one or two of the large pipe foundries, amounting, it is said, to over 20,000 tons, but details are kept quiet.

Blooms.—There is no change in prices, but a fair business is doing at previous quotations, viz.: Sunken Scrap Blooms (2464 lb), $38 @ $39; Northern Ore Blooms (2240 lb). $33 @ $37; best quality Charcoal Billets (2240 lb), for wire and steel purposes, $58 @ $60; Bars do., $62.50 @ $65; Sheet Iron Blooms, cornered (2464 lb), $53 @ $55; Cold-blast Charcoal Plate Blooms, $50 @ $53; run-out Anthracite, $45 @ $47.50.

Muck Bars.—There is less activity in the market, simply because an advance of $2 to $3 ₹ ton is asked, which at present buyers are not prepared to give. Holders are firm, however, and $32 is about the bottom figure for good Bars. Buyers offer about $30.

Structural Iron.—Without any important transactions to note, the market is again firmer and it is increasingly difficult to place orders at the prices recently ruling. An advance by fractions of fully $3 ₹ ton has been realized from the lowest point, and at inside quotations there is not much anxiety to obtain business, although in one or two cases during the week orders have been so placed. The character of the trade shows a steady movement in all departments, and the prospects for a healthy demand are entirely satisfactory. We have not heard of any inquiries for large lots since date of our last report, but with the large amount of work already on hand and the constant demand for small lots, there is no danger of work being scarce. Meanwhile we quote same as last week, viz.: Angles, 2.1¢ @ 2.3¢; Tees, 2.3¢ @ 2.4¢; Beams and Channels, 2.5¢ @ 2.7¢, according to specification.

Plate and Tank Iron.—The demand is not much better, although prices are firmer, and in most cases an advance is asked on last week's figures. Higher cost of raw material may be regarded as the chief reason for this, rather than activity in the demand. There seems to be a probability of Plates being wanted for shipbuilding, bridge building, &c., in addition to the usual current demand, so that a slight advance may be regarded as almost certain. There are several new orders in the market now, and we have reason to believe that bids will average nearly $2 per ton higher than during the early part of the month. This, as before mentioned, is due to the increased cost of raw material, and will, therefore, not improve the condition of the manufacturer in any respect. The Plate Iron trade, however, is in a condition to be easily affected by any increase in the demand, so that while there is no prospect of lower prices, it is quite probable that anything like activity in the trade would soon lead to an advance. Meantime the market may be called dull and unsettled, but firm, at the following prices: We quote 1.85¢ @ 1.9¢ for Skelp; Common Plates, 2.1¢ @ 2.3¢; Tank Iron, 2.3¢ @ 2.5¢; C. No. 1, 2.4¢ @ 2.6¢; Shell Iron, 2.75¢ @ 2.9¢; Flange Iron, 3.7¢ @ 4¢; Solid @ Firebox, 4.85¢ @ 5¢, and Best Bloom, 5.5¢ 6¢.

Sheet Iron.—The demand continues active, but manufacturers limit transactions to the smallest amounts possible, and are very unwilling to duplicate orders, although frequently urged to do so. We make no change in the quotations, but, as a rule, the outside figure is asked, and, unless for very large orders, is usually obtained. Sales have been made for delivery up to June and July, but, in most cases, at a slight advance on similar transactions made during the past week or two. We quote the market firm as follows: Common Sheet, No. 20 to 23, 2.9¢ @ 3¢; No. 24 to 26, 3¢ @ 3.1¢; No. 27 to 28, 3.2¢ @ 3.3¢; Best Refined Sheet, No. 25 to 28, 3.3¢ @ 3.4¢; No. 22 to 24, 3.2¢ @ 3.3¢; No. 16 to 21, 3.1¢ @ 3.2¢; Best Bloom Sheets, No. 25 to 28, 5.2¢ @ 5.3¢; No. 22 to 24, 5.1¢; No. 16 to 21, 4.8¢ @ 4.9¢; Refined Plates or Blue Annealed, 5-16 to 16, 2.4¢ @ 2.5¢; American, R. G., 5-16 to 16, 3¢ @ 3.1¢; Best Bloom, 5-16 to 16, 4.9¢ @ 5¢; A Patent Planished, 10½¢; B Patent Planished, 9½¢; Best Bloom Galvanized, 45 % discount; second quality, 55 %; extra discounts for large lots.

Bar Iron.—A meeting of manufacturers, as announced last week, was held in this city on the 21st, particulars of which may be found in another column. The meeting was largely attended, representatives being present from all the leading mills east of the Alleghenies. The reports from the various districts were nearly all to the effect that there was plenty of business, but most unsatisfactory prices, which, in fact, for a long time has been the condition of business as reported in these columns. The effect of the meeting has been salutary to the trade, and greater uniformity in prices will no doubt be one of the results. A committee was appointed to arrange for a new list of extras, and this matter, when settled, will also be a great advantage to the trade. The fact that business was reported active in all the various sections seemed to be a new idea. Some appeared to be laboring under the impression that their particular case was exceptional, and due, perhaps, to very low prices, but when it was found that all were similarly affected, the necessity for unremunerative rates at once disappeared. The outcome of this exchange of views will no doubt be a permanent benefit to the trade. There is another difficulty, however, which is frequently met with, and one which buyers alone can control, that is, in testing Iron when it is sold as guaranteed. We have been informed that "guaranteed" is a word which has very little significance with some sellers, except that the use of it frequently is an aid in securing an order. With others, it shuts them out of business, because in making bids they calculate on certain tests being made, and are compelled therefore to make their price in proportion. It is claimed that this is the only explanation why some mills are able to make money at prices which would be ruinous to others. The demand for Bars continues good, and prices are again firmer, with prospects of an encouraging nature in all directions. The advance is more marked in low and medium qualities than in best refined Iron, but the increased cost of raw material will no doubt lead to higher prices at an early date. Some large orders are floating around, while others, reaching over 2000 tons, have been placed during the past few days, but it is said prices were very low. The demand is of a general character, the heaviest orders being in connection with railway supplies, car-building, track, equipments, &c. Sellers are very firm, and it may be regarded as certain that whatever changes may occur will be in the direction of higher figures. We quote, 1.7¢ @ 1.95¢, according to quality; large sales at medium figures.

Steel Rails.—There is no change to note; prices are steady and firm, without any effort on the part of sellers. Sales have been confined to small lots as a rule, although we hear of one order for 6000 tons having been placed with the Cambria. Orders could easily be obtained for large quantities, but the mills have their capacity pretty well engaged, and are quite indifferent to new contracts. We repeat our late quotations, although it would probably be difficult to place orders at the inside figure, say $42 @ $45 at mill, according to location.

Iron Rails.—The condition of the market is unchanged, although the feeling is one of much firmness, and higher prices are anticipated before long. Sales during the week have not been important, although there are large orders under consideration. One transaction of 16 lb. section has been made on foreign account, but particulars cannot be obtained. It is understood, however, that the quantity is important and the price somewhat higher than in recent transactions. We quote $32.50 to $35 at mill, according to location, section of rail, terms of payment, &c.

Spikes.—There is a very active demand, and prices are slightly higher, as follows: 5½ x 9-16, 2½¢.; ¼ x 4 and longer, 2 4-10¢.; 7-16 x 4, 2½¢.; ⅜ x 3½ and longer, 2 8-10¢.; ⅜ x and longer, 2 9-10¢.

Old Rails.—The market is unchanged, and very little business doing on the spot. Sales have been made in small lots at $20.50 @ $21, and very superior quality at higher prices. Streets have sold at $22.50, with the same price bid and refused. At outside points sales of large lots of T rails have been made at prices quite up to the quotations of last week—say $21 Harrisburg, $23.50 Pittsburg—and the market may be considered firm but quiet.

Old Car Wheels.—The market is very firm, with an active demand. Sales at an outside point, to the extent of about 700 tons, have been made at $17 @ $18, which may be regarded as about an average price.

Scrap Iron.—Offerings are light, and with an unusually active demand, prices are firm, with an upward tendency. Cast is quoted $13.50 @ $15; Wrought, $21 @ $23.

Nails.—There is no change to note in the Nail market; the demand is good and prices are steady, but not higher. The prospects for a heavy demand during spring and summer seem to be good, and there can be no doubt prices are at a safe point for investment.

PITTSBURGH.

Office of *The Iron Age*, 77 Fourth Avenue,
PITTSBURGH, PA., Feb. 25, 1879.

The winter holds on with wonderful tenacity, and the continued rough weather, together with bad roads and a navigation very much restricted, is having its effect upon business, which is not what it ought or should be at this particular time. The first of March is close at hand, yet the weather during the past week has been cold and stormy, bad enough for December or January; and the remark is frequently heard about this having been an unusually long winter. However, vegetation is backward and will not be in so much danger of the spring frosts, and then the snow, which has covered the ground, with the exception of a few weeks possibly, since early in December, has been a protection to the crops in the ground, and the prospect at the present time is favorable for a good yield of winter wheat, which is an essential element to the general prosperity of the country. While it is true that farm products are very much depreciated as compared with the past 17 or 18 years, it is worthy of mention in this connection that there has been a corresponding shrinkage in everthing the farmer has to buy; hence they are just as well off as other people.

As noted in our report of last week, owing to the heavy emigration to nearly all the Western States and Territories during the past two years, our manufacturers are expecting largely increased orders from there this spring, and it is hoped that they will not be disappointed. There is no doubt but there will be a good deal of improvement made in these States and Territories this spring and summer, both in town and country; hence there will be an increased consumption of Iron, Nails, Window Glass, Hardware, as well as Pittsburgh manufactures generally. That there will be an increased demand this spring for the articles in question scarcely admits of a doubt, and we have hopes that our manufacturers will be enabled before long to obtain remunerative prices.

Pig Iron.—There has been very little change in the situation during the past week; while the volume of business was small, as compared with the preceding week, the market continues firm in tone, and the producing interest generally entertain hopes of being able to secure better prices before long, notwithstanding there is nothing in the position of the market for the products to warrant any improvement in the price of the raw article; indeed, on the contrary, the latter is bringing more money relatively than the former. There is a belief, however, that if Pig Iron was advanced a dollar or two per ton, the products would of necessity sympathize, and the demand would no doubt be stimulated thereby, as is always the case with an advancing market; whereas if there is no improvement in the former, the prospect for obtaining better prices for the latter are not encouraging. It is well known that producers, even those most favorably situated and enjoying the greatest advantages, are making no money, and unless there is an improvement in prices some of those now in blast will be compelled to blow out. As previously stated in these reports, the cost of production is greater now than it was early in the winter; hence there is no alternative for the producer, in the absence of better prices, but to blow out. It is worthy of notice that the great proportion of the business recently has been in the lower grades; while there is no abatement in the demand for standard irons, consumers, owing to the fact that they are held from two to three dollars per ton above the former, are buying just as little of the latter as they can help, notwithstanding, when yield and quality are taken into consideration, the high priced article is the cheapest of the two. It is probable that the activity and firmness reported in the East recently will have some influence on the Western merchants, and as already stated, producers hereabouts are confident of being able to realize an advance before long. We have no desire to advise consumers, but we do think that those who have little or no stock should see to replenishing, and that, too, at once, as prices may go up before they expect; and then there is certainly no risk in buying at current rates, for when there is a change it will, without doubt, be upward. We repeat former quotations: Bituminous Coal-smelted Iron, $18.50 @ $20, 4 mos., for Foundry, and $17 @ $19.50, 4 mos., for Mill; the outside figure for all-ore Red Short. Coke, from native ores, $18 @ $19, 4 mos., for Foundry, and $16 @ $16.50 for Mill. Anthracite, $18 @ $20, 4 mos., for Foundry, and $16 @ $17 for Mill. Last sales of Hanging Rock at $23, 4 mos., for No. 1 Foundry, and $20, cash, for No. 2. Eastern Cold Blast Charcoal selling at $29, cash, to $30, 4 mos. Bessemer Pig, $20, 4 mos. Blooms quotable at $40 @ $55, 4 mos., according to quality.

Manufactured Iron.—The general report by manufacturers is that business is backward as compared with what it should be at this particular time, which is attributed to the rough weather and bad roads in the country; true, orders have commenced to come forward, and some mills are pretty well supplied, but they are the exceptions, not the rule. It is expected, however, that trade will brighten up materially in the course of a few weeks, or as soon as there is some good weather; and, if the cost of the raw article should be increased, as seems probable, prices for the products will no doubt sympathize. Herein is the most discouraging feature connected with the business at the present time. It seems strange that buyers should, in view of what has been stated, continue to hold off with the expectation that prices may go still lower, when all the indications point in the opposite direction, but such is the case. They have had it their own way so long that they, apparently, think any advance is simply out of the question, but they may wake up some of these days and find that they have made a mistake. Whenever a standard article like Iron is selling at or below cost, there cannot be much danger in laying in a stock, and we would advise jobbers and consumers to make a note of this, and be governed accordingly. For good

stock, prices may be fairly quoted on a basis of 1.70¢ @ 1.75¢, 60 days, for Bars, with the usual discount of 2 per cent. for cash.

Nails.—While there is considerable inquiry, but few orders are being placed, from which it is evident that buyers are holding off in expectation of being able, sooner or later, to stock up at lower prices. In this, however, we think they will be disappointed. The fact of the matter is, there is little or no margin for profit at Association rates, and Pittsburgh manufacturers have arrived at the conclusion that they had better do nothing than work for nothing. With the exception of a little local trade, there has been nothing done in Pittsburgh all winter, and while some of the Wheeling factories are running, we learn that they are making but few sales. We look for an increased demand within the next few weeks, or as soon as navigation is more fully resumed and there is some good weather. Prices remain as last quoted—$2.05, 60 days, with 2 % off for cash.

Horse and Mule Shoes—On 100-keg lots prices are still quoted as follows: Government pattern, $3.50 ₱ keg for Horse and $4.50 for Mule; and Roadster pattern, $3.75, cash.

Railroad Spikes.—There is no abatement in the demand, and the recent advance is well maintained. We continue to quote at 2¼¢ ₱ lb, 30 days.

Rails.—The market for Steel Rails continues firm at $43.50 @ $44, cash, delivered free on cars in Pittsburgh, and the Edgar Thomson Company are refusing orders for delivery this side of September. Steel Rail Ends still quoted at $28 @ $32, cash at mill, according to lengths. Old Iron Rails, $23 @ $23.50, and easier.

Wrought-Iron Pipe.—The market for all kinds of Wrought Pipe continues dull, and prices are irregular and unremunerative, with but little prospect of any improvement in the latter respect. We continue to quote discounts at 35 @ 40 off the new, and 65 @ 70 off the old list, on Gas, Water and Steam Pipe. Boiler Tubes, 45 off. Oil-well Tubing and Casing, net cash.

Steel.—There is nothing particularly new to report in this important Pittsburgh interest; business just fair, while prices remain unsatisfactory. Tool Steel, 10½¢ @ 12½¢, as to quality and brand; Machinery do., 5¢ @ 7¢; Boiler plates, 6½¢ @ 7½¢. It is rumored that our manufacturers are making an effort to unite and establish uniform prices.

Scrap.—The market continues fairly active and prices are firm, with dealers disposed to demand an advance, claiming, as they do, that prices here are entirely too low when the cost at sources of supply is taken into consideration, and this accounts for the light receipts and limited supply. We repeat last week's prices: Old Car Wheels, $20 @ $20.50, gross, 4 mos.; R. R. Metal, $16; Cast Borings, $11 @ $11.50; Wrought Scrap, $22 @ $22.50, net; R. R. Car-Springs, $31; do. Axles, $28; Wrought Turnings, $15; Boiler Scrap, $23.

Coke.—As stated in our last, the demand is not as brisk as it was a few weeks ago, but the trade generally still have about all they can do, and prices are fully maintained. We continue to quote at $1.15 @ $1.25 ₱ ton, delivered free on cars at ovens.

Window Glass.—There is considerable inquiry, and the market is firmer, manufacturers generally not inclined to take large orders at current rates—75 and 10 for carload lots and 75 in a jobbing way. We understand that a meeting is soon to be held in this city, to which all the manufacturers in the country will be invited to attend, the object of which, there is reason to believe, is to put up prices. The time for the meeting has not yet been fixed.

Petroleum. — This important interest continues in an unsatisfactory condition, and there will be no improvement until exporters enter the market for Refined. The great proportion of the refineries, not only here but elsewhere, have been stopped for some time past; hence the consumption of the raw article is light and the supply steadily accumulating.

CHATTANOOGA.

Office of *The Iron Age*, Market and 8th Sts., CHATTANOOGA, Feb. 22, 1879.

General business showed some improvement over the previous week. The movement of stock, feed, tools and agricultural machinery to the cotton belt has fairly opened. Plowing in this region and down to the gulf has progressed favorably in the last few days. The Iron movement still has about it the hand-to-mouth feature, consumers buying what they must have for the present and no more. Prices for all kinds of produce continue very low, and this tends to retard any improvement in the Iron market. The weather for the week has been fairly favorable for out-door operations ending to-day, with a heavy and steady rain.

Pig Iron.—There is nothing new to note. Sales keep about even pace with production, except in No. 1 Foundry and other high grades, which are scarce. Coke Irons—No. 1 Foundry, $17.50 @ $18; No. 2, $16 @ $17; Gray Forge, $14 @ $14.50; White and Mottled, $12 @ $12.50. Hot-Blast Charcoal—Foundry, extra, $20 @ $21; ditto, $18 @ $20; No. 2 Foundry, $16 @ $18; Gray Forge, $15 @ $17; White and Mottled, $15. Cold Blast Charcoal—Car Wheel Metal, $22.50 @ $27.50; do., Extra Standard, $24 @ $29.50; Forge, $17 @ $22.

Muck Bar.—$27 @ $34. Old Rails, $18 @ $18.50. Old Car Wheels, $18. Wrought Scrap, $17 @ $19.

Old Rails and Wrought Scrap are scarce, and prices rule stiff.

Ores.—Brown Hematite, 50 to 56 %; per ton, $1.75 @ $2.25. Red Fossiliferous, 50 @ 56 %; per ton, $1.20 @ $1.60. The above prices for ores delivered in Chattanooga on cars, or on the wharf from flat boats.

Nails.—The demand is heavy, and the mills have sold ahead several months. No change in prices. We quote at $2.25 rates, stiff, usual discount on job lots.

Manufactured Iron.—Trade is good, the demand being quite as large as can be supplied. The mills are all running full, and have plenty of work ahead. We quote Bars at $2; Railroad Spikes, 2.50; Light Rail, 2.25; Track Bolts, $3; Trestle Bolts, $4.

Coke.—We quote Washed Foundry, at 11¢ @ 15¢ ₱ bushel, free on cars in Chattanooga. Furnace Coke at $2 @ $2.50 ₱ ton, with full supply in market, and prices weak.

Coal.—Household Coals, 12½¢, delivered. Run of mine to manufacturers, $1.50 @ $1.75 ₱ ton.

Pig Lead.—From local mines, 4¢.

Ingot Copper.—The slight advance realized is maintained. We quote at 18¢.

Iron Rials.—The mill here quotes them dull at $34.50 @ $35. There is little doing except in the way of re-rolling small lots.

CINCINNATI.

Messrs. E. L. HARPER & Co., under date of Feb. 24, write us as follows: The past week has not developed any particular features. Good Irons are not in over-abundant supply, and many of the furnaces have orders ahead that will keep them busy for some months. Lower grades are easier to pick up, at about the same prices ruling before the first of the year. Quotations unchanged:

HOT-BLAST FOUNDRY.

Hanging Rock C. C., No 1	$21.00 @ .....
" C. C., No. 2	10.00 @ 10.50
Hanging Rock Coke and S. C., No. 1	17.00 @ 19.00
" S. C., No. 2	15.00 @ 17.00
Virginia Coke, No. 1	16.50 @ 19.00
" No. 2	17.50 @ 18.00
Shawnee Am. Scotch, No. 1	20.00 @ ...
" S. C., No. 2	16.50 @ 17.50
Hocking Valley S. C., No. 1	18.00 @ 19.00
" S. C., No. 2	16.00 @ 17.00

FORGE IRONS.

Hanging Rock, No. 1 C. C.	18.50 @ 19.00
Hanging Rock, No 1 Coke	16.50 @ 17.00
Longdale, No. 1 Coke	17.50 @ ....
Ala. and Tenn. No. 1 C. C.	17.50 @ ....
Red-short, No. 1 Coke	18.50 @ 19.50
Cold-short, No. 1	15.50 @ 16.00
Old Rails, prime	cash, ... @ .....

CAR WHEEL AND MALLEABLE.

Hanging Rock C. B.	28.00 @ 30.00
Cherokee C. B.	28.00 @ .....
Southern and Western Brands	26.00 @ 28.00

ST. LOUIS.

G. A. MILLARD, under date of Feb. 22, writes us as follows: The demand for Pig continues good, and prices remain firm. Old Rails are scarce and higher, owing, no doubt, to severe weather, which has retarded laying of Steel.

CHARCOAL.

No. 1 Hanging Rock	$23.00 @ 24.00
No. 1 Tennesse and Alabama	20.00 @ 21.00
No. 1 Missouri	20.00 @ 21.00

COKE.

No. 1 Hanging Rock	$21.00 @ 22.00
No. 2 " "	20.00 @ 21.00
No. 1 Tenn., Ala. and Ga.	20.00 @ 21.00
No. 2 " "	19.00 @ 20.00

FORGE IRON.

No. 1 Tenn., Ala. and Ga.	$17.00 @ 17.50
No. 1 Missouri	17.00 @ 17.50

COLD-BLAST CAR WHEEL.

Hanging Rock	$32.00 @ 35.00
Tenn., Ala. and Ga.	28.00 @ 30.00
Missouri	28.00 @ 30.00

SILVER GRAY.

Hanging Rock	$17.00 @ 18.00
Tenn., Ala. and Ga.	17.00 @ 18.00
Old Rails, gross	22.00 @ 23.00
Old Car Wheels, gross	20.00 @ 21.00
Scotch Pig	... . @ 28.00

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of Feb. 24 write us as follows: There has been no change since last week. Prices continue very firm, with a growing scarcity of some grades. The usual time, 4 mos., is allowed on the quotations below:

FOUNDRY IRONS.

No. 1 Hanging Rock, Charcoal	$21.00 @ 22.00
No. 2 " "	19.00 @ 20.00
No. 1 Southern, Charcoal	18.00 @ 18.50
No. 2 " "	17.00 @ 17.50
No. 1 Hanging Rock, Stonecoal and Coke	19.00 @ 20.00
No. 2 Hanging Rock, Stonecoal and Coke	18.00 @ 18.50
No. 1 Southern, Stonecoal and Coke	19.00 @ 19.50
No. 2 " "	18.00 @ 18.50
"American Scotch"	18.00 @ 19.00
Silver Gray	16.00 @ 17.00

MILL IRONS.

No. 1 Charcoal, Cold-short and Neut'l.	16.50 @ 19.00
No. 1 Stonecoal and Coke, Cold-short and Neutral	17.00 @ 17.50
No. 2 Stonecoal and Coke, Cold-short and Neutral	16.50 @ 17.0
No. 1 Missouri and Indiana Red-short.	20.00 @ 21.00
White and Mottled, Cold-short and Neutral	15.00 @ 15.50

CAR WHEEL AND MALLEABLE IRONS.

Hanging Rock, Cold-blast	32.00 @ 33.00
Alabama and Georgia, Cold-blast	28.00 @ 30.00
Kentucky, Cold-blast	27.00 @ 30.00

W. B. BELKNAP & Co., Iron and Steel merchants, Nos 113 and 115 West Main street, under date of Feb. 24, report a falling off in general trade during the past week. There can be little doubt that the severe change in the weather early in the week is responsible for this. Another heavy snow storm was succeeded by bitter cold, the mercury falling again to zero and below. Every time that this has happened it has sufficed to check out-door operations, and restrict business to an extent that would hardly be believed in more northern latitudes. Our more important manufacturing establishments, including car works and plate-glass factories, are still crowded with work. The plow factories, of which we have the largest in America, are strained to the utmost to supply the belated, but now pressing, demands of the extreme South. A good deal of quiet railroad construction and reconstruction is going on and more projected. We quote Iron prices strong and the Nail card fully sustained.

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, writes as follows under date of Feb. 24: This market is very firm for Pig Iron, Old Rails and Wrought Scrap. No material advance is noticeable.

American Scotch Pig Iron	$21.50 @ 22.50
Anthracite, No. 1	19.00 @ 20.00
" No. 2	18.00 @ 19.00
" No. 3	17.00 @ 18.00
" Mottled	14.50 @ 15.50
Coke, No. 1	19.00 @ 20.00
" No. 2	18.00 @ 19.00
" No. 3	16.50 @ 17.50
Va. Cold-blast Charcoal, Cold-short	20.00 @ 23.00
Va. " " Neutral	27.00 @ 28.00
Va. Warm-blast " Cold-short	18.00 @ 21.00
Va. " " Red-short	17.00 @ 18.00
Old Rails	17.50 @ 18.50
Wrought Scrap No. 1	17.00 @ 18.00
Cast " (machinery)	15.00 @ 16.00
Richmond Refined Bar Iron	90. @ ....
Horse Shoes per keg	... @ 4.00
Mule " "	.... @ 3.00
Old Dominion Nails, Standard Size, ₱ keg	2.25 @ ....

Freights to Philadelphia, $1.40 per ton of 2240 lbs., by sail.

Freights to New York, $1.60 per ton of 2240 lbs, by sail.

BALTIMORE.

Mr. W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of Feb. 24: The buoyancy in this market noted in our last weekly report has continued, and has created an improved demand at advanced figures. We therefore append revised list.

Refined Bar Iron, 1 to 6 by ⅜ to 1 ₱ lb	1.90 @ 2 ¢
" " 1 to 4½ by 1½ to 2 "	1.90 @ 2 ¢
" " ¾ to 2, Round and Square	" 1.90 @ 2 ¢
Hoop iron, 1½ wide and upward	" 2½ @ 2¾¢
Band Iron, from 1¼ to 4 in. wide	" 2¼ @ 2½¢
Horse-shoe Iron	" 3 @ 3½¢
Norway Nail Rods	" 4½ @ 5¼¢
Black Diamond Cast Steel	" 12½ @ 13 ¢
Machinery Steel	" 7 @ 8 ¢
Cast Spring Steel	" 4¾ @ 5¾ ¢
Homogeneous Steel Plate	" 5 @ 5½¢
Common Horse Nails	" 10 @ 14 ¢
R. R. Spikes, 5½x9-16	2½¢ @ 2¾¢
Perkins' Horse shoes, ₱ keg of 100 lbs	$3.62½
" Mule shoes	4.62½

	10	9	8	7	6
Putnam Horse Nails ₱ lb	18	19	20	21	23¢
Globe Horse Nails ₱ lb	18	19	20	21	23¢

Less list discount to the trade

Messrs. R. C. HOFFMAN & Co., Iron and Commission Merchants, No. 23 South Frederick street, report the Pig Iron market as follows, under date of Feb. 24: The Iron market remains as last reported. Stocks on hand very low and prices firm. We quote:

Baltimore Charcoal Wheel Iron	$27.00 @ 29.00
Virginia " "	28.00 @ 30.00
Anthracite No. 1	19.00 @ 20.00
" No. 2	18.00 @ 19.00
" No. 3	16.00 @ 17.00
" Mottled and White	13.00 @ 14.00
Charcoal, C. B. Blooms	50.00 @ 52.00
" " Billets	52.00 @ 55.00
Refined Blooms	45.00 @ 50.00

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

LONDON, ENG., Feb. 10, 1879.

THE WEATHER

having improved very considerably during the past few days, we may reasonably look for an altered state of things in several branches of business, especially the building trades and those pertaining to the agricultural implement interests. The frost and last snow disappeared on Wednesday last, since which we have had a good deal of rain. On Saturday we had quite a warm, sunny day, which was a welcome change from the sullen, leaden skies of the past two months. It is, of course, too early as yet to presume that we have passed the whole of the wintry ordeal, but we are not without the hope that we have passed the Rubicon, and that we may venture to count upon a promising spring trade. Already the long-pent orders for constructive iron-work—joists, girders, pillars, tie-rods, nails, screws, hinges, locks and door furniture and *id hoc genus omne*—are beginning to pour into the Black Country and Birmingham, which will no doubt heartily welcome their arrival. The same thing may be said of the implement works, and in a certain measure of many of the minor branches of the iron and steel trades.

IRON GENERALLY

remains in most indifferent request all over the country, there being the greatest possible difficulty in obtaining orders, and still more in obtaining the settlement of outstanding accounts. In Scotland and the North of England the pig-iron producers appear to have no alternative but to make up their minds to a further reduction of the output, inasmuch as their stocks continue to grow larger, with no compensating elasticity of demand. Throughout South Staffordshire the furnaces present a melancholy picture, the twenty-five in blast being sadly in contrast with the 127 out. For merchant and all kinds of manufactured iron there is scarcely any sale, speaking comparatively, and in many kinds of rods, wire billets and wire itself, sheets, &c. Belgian manufactures appear to be gaining ground rapidly, especially in the London market, which they can reach by sea as, or more, cheaply than our own makers can by rail.

QUITE AN AMERICAN COLONY

is accumulating in London, its head center and point of radiation being the Langham Hotel, in Portland Place—one of the most magnificently fitted-up establishments of its kind in this "big brick-field," as one of the newest arrivals from your side dubbed it in my hearing the other day. The same gentleman, I may say, nevertheless admitted that if Americans wanted to get any share of the world's trade, they had "got to come to London." At one house, within a short distance from the Langham, are located no fewer than ten representatives of United States firms engaged in various businesses. Most of this gregarious half score are, I understand, doing an encouraging amount of work, and are animated with strong feelings of hope as to the immediate future. They "peddle" all sorts of things—locks, chilled wheels, milling machinery, stamping presses and dies, locomotives, implements, tools, notions, and many other products of your manufactories. Some of them report a good deal of prejudice against "Yankee" goods: but they find, on the other hand, plenty of persons who are quite willing to take up anything which is *obviously* better or cheaper, or both, than the similar articles heretofore and now in use here. Most of these "drummers"—I suppose they come under that head—are young men, and have an abundance of push in them, but I take it that the newer arrivals will not set the Thames on fire until they have rubbed off some of their characteristic American angularities, and have, to a certain extent, adopted our ways. They have, it is true, the advantage of being unfettered by our conventional memories and practices, and they certainly benefit by the large amount of gratuitous advertising which American wares in general are getting just now, by means of the incessant newspaper discussions on foreign competition with ourselves. The lock question is a pertinent example of this, and I should imagine that any of your best lock, &c., manufacturers who might be sufficiently enterprising to seize the opportunity by advertising themselves and by opening out agencies, would reap a very bountiful harvest and lay the foundation for a steady trade in the future. To insure this result, I would add, only well-made articles must be sent over, and such as are suitable to our requirements. To send cheap rubbish now would be to effectually damn your future prospects on this side, and to send purely American goods would simply leave the things unsold. Impartial judges do not altogether look to you for cheapness, but more particularly for excellence of manufacture and novel designs.

THE GREAT STRIKES

in London, Liverpool and other parts of the country which have broken out during the past week may, and in all probability will, be over by the time this reaches you, but no letter leaving this side just now can be considered complete without some reference to them. Here the majority of the engineers, boiler makers, riveters, &c., of the Thames-side firms are out on strike, and talk of holding a mass-meeting on Blackheath for the purpose of expounding their views and expatiating upon their grievances. So far, however, there has been no disturbance. The masters are quite firm in their action for reducing wages (longer hours are not included in the fight), and if they remain in that mind for a fortnight I shall expect to see them win. At Liverpool there is some excitement, and the military were called out on Friday, but their active services were not needed. It is stated that something like 20,000 to 30,000 men are out, including the dock laborers, some of the sailors, the boiler makers, engineers and other miscellaneous classes of workmen. The cessation of labor has caused some, perhaps a considerable amount of inconvenience to shippers and receivers, but the great steamship companies have already imported 500 laborers from Glasgow, and express a determination not to give way in the slightest imaginable degree. The sudden cessation from labor of so large a body of men must necessarily cause a notable disruption of business, and occurring as it does at a great distributing centre like Liverpool, its effects are likely to be widely felt. If the employers remain well knit together there is no shadow of a doubt of their power and their ultimate success, and also of the folly of the men. Whatever may be the outcome of this rashly advised and intemperate strike, Liverpool is almost certain to be damaged by it. Were the men to succeed, shippers would remove their vessels to Bristol or some other port, and that course is equally likely to ensue in case the dispute lasts any length of time. At a time like this, when nearly one-fourth of the whole industrial population of the United Kingdom is barely removed from want, it is sheer suicide for these or any other men to resort to strikes and to threaten violence.

FREE TRADE AND RECIPROCITY—MEETING IN LONDON

There has been a very largely and influentially attended meeting to-day of commercial men at the Cannon Street Hotel City, under the chairmanship of Mr. Alderman Knight, for the purpose of memorializing the Earl of Beaconsfield in support of a parliamentary inquiry, or a royal commission, with respect to the prolonged depression of trade. In opening the proceedings the chairman told his hearers that he did not think the citizens of London had ever assembled to discuss a matter of greater importance. He did not wish it to be said that they had met to enunciate a return to the policy of protection, nor that they had met to denounce a proper system of free trade. He himself had been a firm free trader all his life; he was a free trader now, and firmly believed in the principles of free trade, but he could not fail to see that after thirty or forty years' experience of it, other nations had not followed in our wake. Not only did they find all the Continental nations had closed their ports against our manufactures and protected their own by heavy duties, but they found that those nearest and dearest to us—our own colonies—had likewise found it necessary to adopt a system of protection. When we looked around us at home we found sugar, corn, &c., cheaper than ever before known, and yet our manufactures are pretty nearly at a standstill; all the great interests of the country are materially and badly affected and the working population plunged into the most dire distress. Under these circumstances it was necessary and incumbent upon them, as sensible men, to pause and inquire whether they could not find some reason for the present extraordinary state of affairs. The full text of the memorial and resolutions passed are as follows:

"MEMORIAL TO THE RIGHT HON. THE EARL OF BEACONSFIELD, K. G., ETC.

"*My Lord.*—At a meeting of merchants, manufacturers and others of all political parties, assembled at the Great Hall of the Cannon Street Railway Station Hotel, Monday, Feb. 10, 1879, it was resolved to memorialize the government, through the medium of your lordship, to consent to a Royal Commission to inquire into the prolonged depression of trade, with the view of modifying, if necessary, our so-called 'Free Trade' system.

"The reasons given for the inquiry were:

"1. That the serious condition of commercial affairs in England, and the distress now prevailing, may perhaps be attributed to the extent with which the wants of England in regard to manufactured goods are being supplied by foreign countries, to the exclusion of British capital and British industry.

"2. That inquiry may show that the exclusion of British capital and British industry may be caused by our 'free trade' system not having resulted as predicted confidently by its promoters, who expected that if England set the example other nations would be sure to reciprocate. Not only have other nations not reciprocated, but the small modicum of concession granted is about to be withdrawn, which will produce a state of affairs even more unfair than that from which England is now suffering.

"3. That the superior cheapness of manufactured goods over those of competing protectionist countries promised as consequent upon the acceptance of free trade has not been perceptible, but the2, on the contrary, almost all the manufactured goods of England are undersold by the protectionist countries of America, Germany and France.

"4. That the excess of imports over exports manifested by the Board of Trade returns, calls for inquiry, and especially as to how far this is caused by the investment of British capital in foreign countries, to the injury of domestic producers, who are by these excessive imports subject to extraordinary and unfair competition.

"5. That the deplorable condition of the agricultural and working population is an urgent reason for the inquiry.

"6. That taxes on manufactured goods would not only place England in harmony with neighboring competing nations, who desire to reserve their own consumption for their own producers, but would harmonize better with colonies and possessions which are quite unable to reciprocate a system of free trade.

"7. That the meeting is quite aware that there are interests that would not desire such an inquiry, and there may be reasons for causing a government to shrink from a hasty condemnation of free trade; but, nevertheless, there are reasons, the meeting respectfully suggests, for an exhaustive inquiry.

"A custom house duty on paper, or even corn, would, perhaps, temporarily increase their price, but the encouragement the duty would give to home production would soon make them even cheaper than they were before, as American cotton goods, by the aid of a prohibition duty upon English cotton goods, has enabled American manufacturers, with less command over their workpeople, to undersell England upon English counters. The manufacturing and agricultural interests of England are so gigantic that the mind shrinks with dismay from the possibility of the present dire and prolonged distress continuing and increasing, and the meeting, without presuming to prejudge the question, ventures to hope that the government, through the medium of your lordship, will accept this memorial, and consent to an inquiry into the prolonged commercial and agricultural distress, not as expressing any opinion of the government for or against free trade, but to satisfy the public mind on a subject of the deepest interest and concern. The accompanying resolutions were put to the meeting and carried. We have the honor to be, &c.

"That this meeting deplores that the confident predictions of the promoters of free trade, firstly, that if England set the example other nations would be sure to extend to her reciprocal advantages; secondly, that the cheapness arising from free trade would enable England to defy the competition of foreign countries in her own and neutral markets, have not been fulfilled, but that, on the contrary, after 30 years' experience, foreign nations are less inclined to free trade than ever; and that, not only is England excluded by prohibition from many foreign markets, but she is threatened by protectionist countries in neutral markets, and her staple manufactures are undersold on her own counters.

"That, in the opinion of this meeting, a Royal Commission should be appointed to inquire into the prolonged depression of trade, with the object of ascertaining in the interest alike of the working classes and of those who employ them, to what extent, if any, one-sided free-trade is responsible for the present manufacturing, commercial and agricultural distress.

"That a copy of these resolutions be forwarded to the Right Hon. the Earl of Beaconsfield, K. G., Prime Minister of England."

SCOTCH PIG IRON

has been quiet, with a moderate business only, warrants being about 42/4 @ 42/6, for cash. Shipments last week were 4969 tons compared with 6550 for the corresponding week of 1878. There are now 207,972 tons in Connal's stores—an increase for the week of 1920 tons. Ballast pig is 40/ per ton alongside. Wm. Colvin & Co., James Watson & Co. and John E. Swan & Bros.' circulars all report a dull state of business.

THE BOARD OF TRADE RETURNS,

for the month of January, just issued, are not of a very encouraging nature, there having been no check in the diminution of our foreign trade. The total value of our exports for the month reached £14,196,518, against £15,423,911, in January, 1877, and £15,946,080 in the same month of 1877. The aggregate tonnage of all the iron and steel was 128,318, worth £1,068,147, as compared with 144,004 tons, valued at £1,264,438, in the same month of last year, and 131,439 tons sold for £1,285,510, in January, 1877. Of arms and ammunition we shipped 23,541, against 18,276; of gunpowder, 928,274 lbs., compared with 1,890,275 lbs.; of manufactured brass, 3891 cwts., against 9109 cwts.; of coal, coke and patent fuel, 1,017,369 tons, compared with 1,012,542 tons.; unwrought copper, 25,655 cwts., against 34,154 cwts.; wrought or manufactured copper, 19,972 cwts., against 22,272 cwts.; yellow metal sheathing, 15,512 cwts., compared with 24,329 cwts.; pig iron, 47,534 tons (of which 3261 to the United States), against 42,943; bar, angle, bolt and rod iron, 11,539 tons (159 to you), compared with 18,312; railroad of all sorts, 20,473 (75 to the States), against 31,832; iron and steel wire, 2572 tons, against 3689 tons; hoops, sheets and plates, 12,521 tons (53 to you), compared with 13,005; tin plates, 12,566 tons (of which 8995 to you and 694 to France), against 11,776; cast or wrought iron, 17,608 tons (749 to the States), compared with 19,219; old iron, 1108 (186 to you), contrasted with 594; unwrought steel 1710 (468 to you), against 1683; manufactures of iron and steel combined, 687, against 951 tons; pig, rolled, &c., lead, 1910 tons, compared with 2259; plated or gilt wares, £19,895, against £15,907; saddlery and harness, £32,803, compared with £29,452; telegraphic wires or apparatus, £40,719, against £26,466; unwrought tin, 5920 cwts., contrasted with 7360; zinc or spelter, 9357 cwts., against 16,110 cwts.

FROM SHEFFIELD AND BIRMINGHAM

there is no particular news of importance

this week, so that I shall make my allusions to both of more than ordinary brevity. South Staffordshire has been a good deal scandalized by a sale by auction in London, on account of a Liverpool concern, of 188 tons of galvanized corrugated sheets, of which 18 tons sold at £10. 15/ @ £14. 17/6, 18 to 28 B. W. G. sizes, 6, 7 and 8 feet.

STEEL RAILS AT £4. 6/ PER TON!!

s the latest curiosity in Bessemer rail competition, the fortunate possessors of the will and ability to sell at that figure being the Wilson & Cammell Co., of Dronfield, near Sheffield, who have, by quoting it, beaten Bolckow, Vaughan & Co. on their own ground. The successful tenderers' price, delivered at Normantown, is £4. 9/6, which includes ¼ ₽ ton carriage to that place. The order was for 25,000 tons, required by the Northeastern Company. This price the Sheffielders are saying, rather broadly perhaps, "licks cockfighting." They want to know how it's done.

NEW RULES AS TO TIN PLATES

come into force on March 1st, per favor of the Manufacturers' Association of that ilk. They are: "Where buyers stipulate for wasters in buying ordinary cokes, they shall not be entitled to more than 8 per cent. of the quantity of primes, at a reduction of 8 per cent. on the price of perfects. The following to be the rates for the description of plates named, in charcoal and coke qualities: Doubles 2/ per box less than 20 x 14 (thus, D C 17-12½ will be 2/ less than I C 14-20, and D X 2/ less than I X, and so on); 20 x 10 to be on basis of 14 x 10, with 6d. added; 12 x 12 to be the same as 14 x 10, with 6d. added; 28 x 20 (112 sheets) to be double 20 x 14, with 1/ added. All other odd sizes to be on the basis of 20 x 14, 14 x 10, 17 x 12½, or 15 x 11, with 1/ per box added."

THE METAL MARKETS

remain very dull, and there is very little business on hand. The *Ironmonger* reports: "*Copper* has been quiet throughout the week, at: Good ordinary brands Chili Bars, £55. 15/, spot; Wallaroo, £65 @ £65. 5/; Burra, £64. 5/ @ £64. 10/; English tough, £61 @ £62; best selected, £62 @ £63; strong sheets, £67. The charters from Chili for the second half of January have been telegraphed as 2300 tons, viz., 1200 tons bars and ingots, 950 tons fine in ores and regulus for the United Kingdom, and 100 tons bars for the Continent. On Feb. 1 the statistical position of this metal was as follows: Stock—Chili ores and regulus, Liverpool and Swansea (equal to fine), 4136; Chili bars in Liverpool, 20,873; Chili bars in Swansea, 2051; foreign copper (chiefly Australian) in London, 5504; ditto landing, 378; English copper in London, 50; Chili bars and ingots and Barilla in Havre, 6286; other copper in Havre, 250; total stock, 39,528 tons. Afloat and chartered from Chili to Europe (advised by mail)—Ores and regulus (equal to fine), 2655; bars and ingots, 4980; total, 47,163 tons. Afloat from Australia (advised by mail)—Fine copper, 2215 tons. Afloat and chartered from Chili to Europe (advised by cable)—Fine copper, 3600 tons; total, 52,978 tons. *Tin* has been steady at £59. 15/ @ £60 for fine foreign, and £62. 10/ @ £63 for English ingots. The statistical position on February 1 was as under: Straits and Australian, spot, 9122; ditto, landing, 403; Straits, afloat, 1225; Australian, afloat, 1605; total, 12,355 tons, Banca, on warrants, 1966; Biliton, spot, 1975; ditto, afloat, 800; Australian tin in Holland, 341; total, 17,437 tons. Deliveries during month—In London, 1050; in Holland, 351; overside to America, 140; total, 1451 tons. Shipments from Straits in January, 1879, 950, and from Australia, 483 tons. From Melbourne this week, 350 slabs; from Galle, 735 slabs (in transit); from Sydney, 2202 ingots; and from Penang, 544 slabs have been imported here. *Tin Plates* continue to sell freely, and prices have a distinctly upward tendency. *Lead* is steady at £13. 15/ @ £13. 17/6 for English pig, and £13. 5/ @ £13. 7/6 for soft Spanish without silver. *Spelter* is in moderate request only at £16 @ £16. 5/ for ordinary brands. The stock on hand on February 1 in London was 194; Hull, 1345; and Grimsby, 332; a total of 1871 tons, against 1789 tons on January 1. *Quicksilver* is quoted at £6. 5/ per bottle, and *Antimony*, £46 @ £47.

FOREIGN.

FRANCE.

(*Moniteur des Interets Materiels.*)

PARIS, Feb. 5, 1879.—*Metals.*—Business in the new year has thus far proved a disappointment generally, and in the metal line in particular. *Copper* has been very quiet, and Chili Bars and Best Selected have declined 1.25 francs per 100 kilos.; ordinary brands Chili 50¢. We now quote first brands Chili Bars 153.75; ordinary do., 148; Ingots and slabs, 155; Best Selected, 160; Corocora Ore, 160; Sheathing, 180; and Yellow Metal do. 170. Havre has been nominal, Chili Bars at 152.50; good Current, 147.50 @ 148.50 for Urmeneta and 146.25 for Lota, Paris conditions. Marseilles has given way 5 francs on Yellow Metal Sheathing. They quote small Refined Ingots 170; Copper in sheets, 180; Bolts, 190; Sheathing, 170; Yellow Metal and Copper, 185. *Tin.*—Billiton has dropped 2.50 francs and Banca 25¢ in this market. We quote at the close Banca, deliverable at Havre, or Paris, 167.50; Billiton, 163.75; Straits and Australian, 191.50, and English at Havre or Rouen, 161.25 the 100 kilos. At Marseilles a fall is reported of 5 francs in Banca and of 2.50 in Straits. They quote Banca 165; Straits, 157.50; French, 165; and English, 170. *Lead.*—This metal is still giving signs of great weakness, and all sorts deliverable here have declined 75¢, and at Havre 50¢. We now quote the various sorts deliverable at Havre 35.75 francs the 100 kilos., and at Paris 26.25; Sheet and Pipe, 50 francs. Arrivals of Spanish continue at Havre. They quote first fusion soft Spanish 38 @ 39 francs. Argentiferous Lead has given way 1 franc at Marseilles, and first fusion 50¢. The following are the closing quotations: Argentiferous, 34; first fusion, 33.50 @ 34; second fusion, 34; Antimonious, 33; Pipe and Sheet, 29; and Shot, 39.50. *Spelter* has followed in the wake of remaining metals, declining here 50c on Silesian and 1 franc on other good brands. We now quote: Silesian at Havre, 43 francs the 100 kilos.; other good brands at Havre, 42.50, and at Paris, 44; Vieille Montagne Sheet, 60; Royal Asturian, 60, and Biache St. Waast, 58. Silesian at Havre, 42.50 @ 43. Marseilles unaltered. They quote Vieille Montagne Sheet, 54; other brands, 53. *Iron.*—This has been an unusually dull week, due to politics. The crisis in the Iron regions of France has been a severe one for some time past, but there are indications of better times coming. In the Haute Garonne, however, one of the foundries has discharged half of its hands. The Haute-Marne is steady; Sheet Iron is neglected in the district; all other goods are doing tolerably well except Hollow-ware. Common Hollow-ware is being superseded in France by enameled. The St. Leger works have applied for authority to work the new Iron mine in the Nancy basin. Manufacturers at the North, now that politics have taken a more stable and pacific turn, seem to be of good cheer as regards the future, and matters are looking up in that region. In the Rhone and Loire there is still a good deal of complaint, although some makers are still engaged in filling orders taken in November and December; but these will soon be executed, and no new business is as yet in prospect except some material which the navy will stand in need of, and which, distributed among a number of producers, will not keep the region busy for a long time; still it will assist them in bridging over a dull period. Shares of the Terrenoire Works have, from 330, declined to 190. The Manganese Iron mine at Alban is soon to be taken in hand. *Coal.*—Activity in the Loire basin has slackened considerably, and the amount of Coal shipped off falls short of the corresponding period of last year, and as for the North and the Pas de Calais, the demand for industrial purposes has been so very feeble that the aggregate amount shipped has not come up to expectations.

BELGIUM.

(*Revue Universelle.*)

BRUSSELS, Feb. 5, 1879.—*Iron.*—The Belgian Iron market does not yet show any improvement, and the aspect is not a reassuring one. The lack of activity at our works is still a striking one. But as this is the dull season, we should guard against drawing any conclusions from it as regards the nearer or remoter future, inasmuch as later on a favorable change may take place, for it is to be presumed that many orders will be received from countries like Roumania, Bulgaria, Turkey and Russia, where a great many bridges and railroad material will have to be restored and replenished, and it is not unlikely that Belgian makers will have their full share in the execution of such works. This will be all the more probable, as prices in Belgium are very low, and hold out great inducements to purchasers. Our producers are content to work at small profit, and are thus able to deliver Iron for architectural and other purposes at rates advantageously competing with wooden structures, especially in countries where timber is scarce and dear. At an adjudication for Iron Tube for this municipality, the lowest tender for Cast-Iron Tube of 2 to 4 centimeters diameter has been 13.30 francs the 100 kilos., and for 6 centimeters 13.92. *Coal.*—Coal for household purposes has been doing remarkably well this winter, but Coal for Iron works, &c., has been comparatively neglected. With the exception of a few species of Coal in special demand, the situation in the Mons and Charleroi basins has shown little buoyancy. Freight from Charleroi to Paris is 9 francs, and from Mons 7 francs.

GERMANY.

(*Borsenhalle.*)

HAMBURG, Feb. 4, 1879.—*Metals.*—The German metal markets have as yet displayed little activity this winter. This has been brought about in part by the severity of the season, and in part by a great many circumstances hampering trade, such as the deadlock with which our trade with Russia across the frontier is threatened, in consequence of the precautions taken against the plague in that country. The economical question, previously alluded to, also causes many dealers to pause until the future is more distinctly defined. But the general dullness has been productive of at least one good—the gradual working off of stocks in second and consumers' hands—and by the time the spring revival does come, we expect business to be all the brisker, the more so as extremely low prices for nearly all metals will be an additional stimulus to the dealings. *Copper* has been steady; we quote here, Drontheim, 60 @ 70 marks the 50 kilos.; Lake, 85; Tough Coke, 66 @ 67; Sheathing, 75 @ 76, and Yellow Metal ditto, 61 @ 62. Berlin sustains the following figures: English and Australian, 63 @ 68, and Mansfeld, 68 @ 68.50. *Tin* is upheld here at 70 marks for Banca and 71 for English per 50 kilos. *Lead.*—The markets in this country have withstood the drooping tendency elsewhere. We remain firm, with English Pig at 16.70, and German ditto at 15 @ 15.50; Spanish, 19 @ 19.50. Berlin continues firm at 14.50 @ 14.75 marks the 50 kilos. *Spelter* is quiet, but no further giving way is reported. We quote Silesian here, 17.50, and at Berlin, 16.75 @ 17.50.

AUSTRIA.

(*Austrian Trade Journal.*)

VIENNA, Feb. 2, 1879.—*Iron.*—The plague scare has had a detrimental effect on business, especially in our relations with Russia. The latter country, which was recovering with some difficulty from the disturbing influences of the late war, is now passing through a severe ordeal, so far as its trade is concerned, both inland and with its most important neighbors—Austria and Germany. At Moscow trade is utterly paralyzed, and confidence is very much shaken at St. Petersburg, so much so that the selling on credit to dealers in the Eastern provinces has, for the time being, ceased altogether. There has been no change in the tendency and prices of Iron in this city. We quote Austrian, Styrian and Corinthian Rods on the spot here 115 @ 128 florins per ton; do. Hungarian, 110 @ 115; Sheet Iron for lock-making, 170 @ 180; and Pillars, 135 @ 150. Charcoal Pig Iron is quoted 45 @ 48; and do. Coke, 52 @ 56.

INDUSTRIAL ITEMS.

MASSACHUSETTS.

The Norway Iron Works of Naylor & Co., at South Boston, now give employment to 450 men, double turn.

The Robinson Iron Company at Plymouth report trade fairly active.

CONNECTICUT.

At the meeting of the directors of the Stanley Works, held subsequent to the last annual stockholders' meeting, Hon. F. T. Stanley was elected president of the corporation for the twenty-seventh successive time.

The annual meeting of the Billings & Spencer Company was held Monday at their office in Hartford, and the following named directors were re-elected: C. E. Billings, W. A. Healey, Lucius A. Barbour, Amos Whitney, George E. Hunt, L. H. Holt, Silas Chapman. At a subsequent meeting C. E. Billings was re-elected president and superintendent, L. H. Holt, treasurer, and E. H. Stocker, secretary. The business of the company is in a prosperous condition, showing an increase of rates for the year ending February 1 over the year previous, and a good profit over all.

The 25,000,000 cartridges which the steamer Norman Monarch took out from New Haven, is the last of the order for cartridges from the Turkish government, which the Winchester shops in New Haven have been filling. In all, the Winchester Repeating Arms Company have supplied to Turkey the enormous number of 400,000,000 cartridges.

NEW YORK.

On Wednesday, February 12th, the stockholders of the Saranac Horse Nail Company, Plattsburg, at an adjournment of their annual meeting, elected the following directors for 1879, viz: S. P. Bowen, J. W. Lynde, H. Veeder, Elric L. Nichols, Andrew Williams, John M. Wever and James H. Signor. The new board of directors then elected the following executive officials, viz: S. P. Bowen, President and Treasurer; Herman Veeder, Vice-President, and J. W. Lynde, Secretary.

John E. Smith, of Buffalo, manufactures annually a large number of the most improved meat cutters. The improvement consists of a simple apparatus attached to the cutter, which turns over and mixes the meat while chopping it. This is the only machine in this country which does all this work without the assistance of hand labor. Mr. Smith is also the only manufacturer of meat-mixing machines. These machines he is shipping to all parts of the country, and also to Germany. His business is increasing every year.

PENNSYLVANIA.

The firm of Mellert & Co., Reading, has received a contract for the manufacture of 2000 tons of bases for the New York Elevated Railroad, the bases weighing 3250 pounds each.

"Tubal Cain," in the Sharon *Herald* of the 21st inst., says: In Sharon, for the week ending Feb. 15: At Westerman Mill puddle, guide and hoop mills double turn, sheet and bar mills single turn, plate mill and nail factory off. No. 2 blast furnace has turned three years and nine months in blast, and still keeps up to its 30 tons a day and over. If it only turns over the fourth year, it will make the longest and most successful blast on record in this or the Mahoning Valley. At Kimberly, Carnes & Co.'s mill, puddle, bar, guide and old hoop mill (8 inch) double turn (bar mill off one day Saturday); new hoop mill off; plate mill and nail factory on. Keel Ridge Furnace doing very well, making a No. 1 mill iron. From Sharpsville Mount Hickory No. 2 working up to over 30 tons a day. Orders have been given to proceed as rapidly as possible in repairing blast furnace No. 1.

The Glendower Iron Works, at Danville, were idle last week. They are to be sold at public auction to-morrow (Friday) by the trustees.

Cofrode & Saylor were awarded the contract for rebuilding the bridge across the Schuylkill at the Falls, which was destroyed by the storm of the 23d of October, 1878. There are two spans to be built, which will be of wood. Their bid was $8500.

The Altoona *Tribune* says: The improvements at the Altoona Rolling Mill are almost completed. The mill is running steadily night and day. Greenwood Furnace, Huntingdon County, intends cutting 10,000 cords of wood the coming season. The Reading Springs correspondent of the *Register* says there is almost a certainty that the Rodman Furnace will shortly be put in blast.

For the week ending Saturday, the 15th inst., the Warwick Iron Co.'s furnace made 351 tons of pig iron. The broken "bell" is still being used, and will be as long as possible. The new bell is on top of the furnace, and can be placed in position within a comparatively short time.

Mt. Hickory Furnace No. 2, at Sharpsville, which went into blast recently, is now working well.

The report to the effect that the Connellsville Locomotive Works had resumed proves to be untrue.

The work of repairing the machinery in Fulton's mill, Norristown, has been finished.

Mr. W. J. Obert, proprietor of the Union Boiler Works, Reading, is quite busy. Among other contracts he is building for Mr. Lewis Miller, of the Patent Cotton Compress, at Galveston, Texas, 3 flue boilers, 48 inches diameter by 26 feet long. He is also building for Messrs. Zehm & Bro., of Kutztown, Pa., 1 flue boiler, 48 in. diameter by 24 feet long. He is also just finishing 2 dummy boilers for the Southwalk and Frakford (Fifth and Sixth streets) Passenger Railway Company, Philadelphia.

The Cambria Iron Company and the Pennsylvania Railroad Company, pay about seven-eighths of the taxes in Milville Borough.

PITTSBURGH AND VICINITY.

The pan factory at the Vesuvius Iron Works, which has been shut down for several weeks, was started again on the 5th inst.

Garrison & Co., on the South Side, are running full in all departments. They are now making rolls for brass work, the order having been received from Connecticut.

Marshall Bros., Pittsburgh, received an order week before last for one of their patent elevators, to be shipped to Philadelphia. They have just been awarded three contracts for their steam power elevators, as follows: One for Mr. John Rooney's new stove warehouse, one for Mr. James E. McFarland, Meadville, Pa., and one for Mr. Otto Kreb's new lithograph establishment. Between thirty and forty of these machines have been sent East by this firm within a few months.

Messrs. Mackintosh, Hemphill & Co. have commenced running double turn and expect to continue for several months.

The Keystone mill, Pittsburgh, has been running triple turn in their puddle department for some time past, making twelve heats per day.

Messrs. Geo. B. Mitchell and J. E. B. Dalzell, both formerly with the Cresent Tube Co., limited, have formed a partnership under the firm name of Geo. B. Mitchell & Co., for the purpose of carrying on the iron commission business. They will make a speciality of iron pipe, boiler and sheet iron.

Lewis, Oliver & Phillips are about to erect another heating furnace for the guide mill, at their Allegheny works.

Under the supervision of R. J. Anderson, the senior member of the firm of Anderson & Co., that firm have completed the erection of the largest open-hearth steel melting furnace, of the Siemens patent, in the world. Last week, at their new works in Pittsburgh, the initial melting test was made, and to the complete satisfaction of the engineers in charge and of the firm.

MARYLAND.

The superintendent of the Cumberland Rolling Mill informs us that they expect to have the mill in full operation in about two months. They are at present running 15 double puddling furnaces and two single puddling furnaces for bar iron. They make about 30 tons of finished bar iron per day.

OHIO.

Some time in last year the old Gaylord Iron and Pipe Works at Newport, opposite Cincinnati, were purchased by several enterprising gentlemen of Cincinnati, and by more recent purchases of real estate there will be about five acres of ground contained within its limits. The old buildings have been put in good condition, with some important additions and improvements in machinery, placing the works in most complete running order, and giving them a capacity of about 100 tons per day. These works will start up on the 1st of March with a full complement of hands. The officers of the company are: Mr. Henry Hanna, president; Mr. George Wilshire, secretary and treasurer, and Mr. Matthew Addy, general manager. These gentlemen are all well known in business circles, and have the means and business capacity to insure success in this line of manufactures in Cincinnati. Since the failure of the old Gaylord Iron and Pipe Company, Cincinnati has been without an iron and pipe works, and the vacant buildings have remained idle. But in a few days the fires of the old foundry and machine shops will again be lighted, and many of the old employees will again resume their labor under an entire new and, we are pleased to add, able management. Besides the manufacture of water and gas pipe of all sizes, and special castings for gas and water companies, the concern will make castings for general work of the largest dimensions. The office of the company is at No. 1 Pike's Opera House, Cincinnati.

The firm of Turner, Parks & Co., Cuyahoga Falls, was dissolved by mutual consent, by the withdrawal of George Parks from said firm. The business will be carried on by G. B. Turner, J. A. Vaughn and W. A. Taylor, under the firm name of Turner, Vaughn & Taylor.

The Baron Mfg. Co., of Bellaire, was organized in 1872, has a paid-up capital of $60,000, and is engaged in producing stamped tinware, lanterns, &c. This company employ 100 hands, paying them weekly about $700.

The Gaylord Rolling Mill at Portsmouth still remains idle.

A correspondent writes the following to the Greenup (Ky.) *Independent* concerning the furnaces in the vicinity of Portsmouth: Our furnaces on the Portsmouth branch of the M. & C. road will run about the same as in the year just closed. Of the charcoal furnaces, Scioto, Monroe, Madison, Jefferson, Buckeye, Keystone, Latrobe and Lincoln are stocking up and will be run this season. Of the stonecoal furnaces, Washington, Fulton and Milton will be in blast. Washington and Milton are now running, making a good quality of iron. Fulton is putting in a new hearth and in-wall. The Wellston Company have not decided as to their future. Monroe is out of blast, and iron about all sold. Madison will blow out this week, having on hand a large amount of the very best No. 1 foundry iron. Buckeye has considerable No. 1 and No. 2 foundry and mill iron on hand.

The Sheridan Horse Nail Co., located in Cleveland, are making extensive improvements and enlargements in their works by an addition of new machinery and buildings. Their capacity is one ton per day, which will be increased to three tons. They have not been able to keep up with their orders for several months. This is the cause of these improvements. They employ 32 hands full time. They have orders on their books from Canada, Australia and South America.

It is rumored that Youngstown is to have another nut-washer factory.

Union Saw Works, Toledo, have orders on their books for 20 large circular saws. They are running 12 hours a day, and cannot keep up with their orders. This company have not been so crowded with work for five years.

The Belfont Furnace is running on three-fourths coke and one-fourth raw coal, native ore and mill cinder, and is making an average of 40 tons of iron per day.

The Burgess Steel and Iron Co., at Portsmouth, are running the plow-steel department of the works on full time, and often on double turn. They have orders on their books to run them for some weeks.

The Cleveland Stamped Elbow Company, formerly known as the Hogen Elbow Company, was established in the spring of 1877, for the purpose of manufacturing stove-pipe elbows. Mr. Hogen has retired, and the firm now consists of S. M. Cady and C. B. Goulder. Their office and works are located at the foot of Mason street, on the Lake Shore Railroad, where they occupy a space of 60 x 120 feet. They employ twenty-five hands when running full capacity, and have facilities to turn out 150 dozen elbows per day. Their trade is constantly increasing. The stamped stove-pipe elbow of Hogen's patent is constructed so as to form a quadrant, and not only is it handsome in appearance, but its circular shape improves the draft. It invariably holds the different sections of the pipe at right angles. The ends have the same taper as stove-pipe. It is easily fitted, and holds securely without the use of rivets. It is manufactured with steam power, by new and improved patented machinery, at much less cost than former processes, and by a process of stamping which neither destroys, strains nor in any way impairs the quality of the metal. It has no crimps, cavities or angles which cause accumulations that rust or corrode the iron; it is also easily polished and kept clean, its surface being smooth and regular. Not only is it exceedingly strong and durable on account of its construction and shape, but it is not liable to be dented or defaced in handling. Their business last year showed an increase over 1877.

MISSOURI.

The St. Louis Malleable Iron Works are busy filling their orders, employing from 100 to 125 men.

KENTUCKY.

Bellefonte Furnace has blown out.

ILLINOIS.

E. Holenshade is the successor of Evans & Co., of the Chicago National Wire Cloth Mill, late of 113 Randolph street, in the manufacture of steel and brass wire cloth and wire goods, with an office at 132 Lake street.

Thomas McAllister, manufacturer of harness, saddles, coach pads, gig and express saddles, &c., is now working a full force, with orders ahead to keep him busy for some time to come.

The Chicago Malleable Iron Company have largely increased the capacity of their works during the past year, to enable them to keep up with the constantly growing demand upon them.

The puddle department of the Springfield Rolling Mill is about to resume. There is much activity at the mill just now.

The Rock Island Stove Works employed 43 men last year. Their products amounted to $95,000.

The Detroit *Post and Tribune* says: Herbert Bowen, assignee of the Wyandotte Rolling Mill, has been granted leave to sell the entire rolling mill property, free from all incumbrance, and the meeting of creditors has been postponed until after sale. This was upon his petition, setting forth that the property originally cost $725,000, but that owing to the depressed condition of the iron business it is now impossible to put any estimate upon the value of the property, or to say what it would bring. There is a mortgage upon the property of $250,000 now in process of foreclosure. But there is a question as to how much of the real estate this mortgage covers and whether some part of it has not been already paid, so that extended litigation is probable. There are also levies upon the property upon judgments in the Wayne Circuit and Superior Courts, amounting to about $20,000. The holders of the mortgage and the judgments above referred to, have all signed a stipulation, consenting to the sale in the manner indicated. It is understood that an arrangement has been made by which the Eureka Iron Company, which holds the mortgage, will be the purchaser. In that case it will put the mill in first-class shape and set things in motion again after the manner of former times.

INDIANA.

The Ohio Falls Car Company, of Jeffersonville, have recently contracted to further equip the Utah and Northern, a narrow gauge railway in the Utah Territory, with one hundred box cars, seventy-one flat cars, four cabooses, three mail cars, three baggage and express cars, three passenger cars, and three parlor reclining-chair cars. The company are building two combination passenger and mail cars for the Macon and Brunswick Railroad of Georgia. They also have under contract one passenger, one mail and express, two cabooses and twenty box and flat cars for the Denison and Pacific Railroad of Texas, and a number of their patent four-wheel side-dump cars for the North Eastern Railroad of South Carolina. The company are at present employing over eight hundred men.

IOWA.

We learn from the *Courier*, of Ottumwa, that the arrangements are all completed for the opening of the Ottumwa Cutlery Works about the first of March. The works will be started by three practical cutlery manufacturers, of whom Mr. W. J. Bastian is the head, all of whom have worked for several years in the celebrated works of the J. Russell Cutlery Co., at Turner's Falls, Mass. The fine brick buildings of the old Des Moines Valley Iron Co. have been leased with water-power privilege. The company will start with a force of twenty-five to thirty skilled workmen, brought from the East, and will for the present make a specialty of fine table cutlery.

The Disston Mausoleum.—There has been on exhibition for some time past, at No. 1510 Chestnut street, a pair of massive and artistic bronze doors, modeled and cast by Messrs. Bureau Brothers & Heaton, of Philadelphia, for the Disston Mausoleum, just built in Laurel Hill Cemetery. The doors are of standard bronze, solid paneled in the lower portion and having an ornamental grille in the upper part, through which the interior of the tomb may be seen. There are bronze shutters inside the doors, which may be shut behind the grille, thus making the doors entirely close when desired. The castings are beautifully finished, and add another to the many fine specimens of artistic bronze work done by Philadelphia artists and mechanics. The mausoleum is constructed by the family of the late Henry Disston, the eminent saw manufacturer. It is a rectangular building, of Westerly white granite, 25 feet square and 50 feet high to the apex of the domed stone roof, which is surmounted by a statue of Memory, 8½ feet high. The exterior walls are ornamented by highly polished granite pilasters, with molded bases and capitals, and the doorway with polished columns of the same stone. The interior is finished in polished white marble, and the structure is said to be one of the most elegant memorial buildings in the country and to have cost a very large sum of money.

Foot Power Bracket Saws

Are now so much in demand that some of them are being sold in almost every town in the United States. Many dealers are doing a profitable Christmas trade on such goods at a time of the year when other business is usually dull. The two Saws shown in these cuts are the ones most in demand. We advertise them as for sale at the hardware stores, and they will be called for. We make a fair discount to the trade.

LESTER SAW.

Lester Saw.

The New LESTER SAW is made of Iron, with all the working parts of Steel, and contains ALL KNOWN IMPROVEMENTS to this date. It is handsomely painted red and green with red stripes, and presents a beautiful appearance. Those parts which are not painted are either Polished or Japanned. We warrant the Saw to be just as herein stated, and we know it will give entire satisfaction, being a more expensive machine than those which we formerly sold for $25. 1st. It consists of a SCROLL SAW, with Tilting Table for Inlaid work; arms 18 inches in the clear; clamps which will hold saws of any length or width, and face them in four different directions, cutting lumber from 1-16th to 1 inch in thickness; speed, 1000 strokes per minute. 2d. A CIRCULAR SAW 2¼ inches in diameter, which will cut lumber ½ inch and less; with an Iron Table 4 by 5 inches. 3d. A DRILLING ATTACHMENT with six Stubs' Steel Drills of various sizes for wood or iron work. 4th. An EMERY WHEEL, with wide and narrow rim. 5th. A TURNING LATHE, with Iron Ways and Rest, Steel Centres and three Best Steel Turning Tools; length of Ways, 15 inches; distance between Centres, 9 inches; swing, 3 inches; length of Slide Rest, 4¼ inches; number of revolutions per minute, 1000. Also, with each Machine, six Saw Blades, a Wrench, Screw Driver, Extra Belt and two sheets of Designs, with a nice box for the small tools and a box for the whole machine. It is taken apart when shipped and packed in a box, but the working parts are all left in place and the frame is put together again by a single bolt.

Price for everything above named, - - - - - $8.00

The same without the Lathe and Circular Saw, - - $6.00

When desired, we furnish with the Lathe a very nice Drill Chuck for working metal, and a Tail Stock, with Screw Centre, for $2.00 extra.

ROGERS SAW.

Scroll Sawing and Drilling Attachment. Iron Table, adjustable for Inlaying.

Rogers Saw.

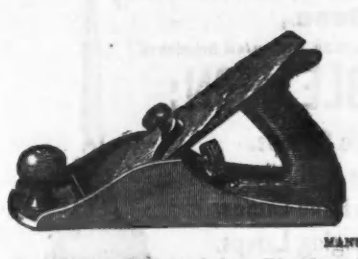
All the working parts of Iron and steel; weight, with box, 30 pounds; hight of table above the floor, 32 inches; 12-inch belt wheel; 5-inch balance wheel; arms 18 inches in the clear; latest improved clamps; round belts; extra drills and wrench. The iron and steel parts are polished or Japanned; the wood is painted dark. It is not as good as our Lester Saw, but is much better than any other cheap machine in the market.

Price, including all the attachments and the box, - - $3.00

MILLERS FALLS CO., 74 Chambers St., New York.

BAILEY WRINGING MACHINE CO.,

No. 99 Chambers Street, New York.



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Novelty and Excelsior Clothes Wringers,
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American Meat and Vegetable Choppers,
Silver's Stuffers and Presses,
Simpson's Quick-Adjusting Parallel Vises,
Novelty and Relief Washing Machines,
Domestic Ironing Mangles.

SPECIAL QUOTATIONS ON THE ABOVE GOODS FOR EXPORT.

Send for Illustrated Price List and Discount Sheet.

ESTABLISHED 1859.

WM. HASSALL,

Manufacturer of

American and French

Wire Nails

With Flat, Round, Oval, Depressed, Screw Fancy Heads, etc.

Brass Hooks for Jewelers' Cases, Zinc and Iron Hinges, Turn Buttons, Thumb Springs, Book Clasps, and Fancy Metal Work of all kinds.

OFFICE AND WORKS: *Nos. 63 & 65 Elizabeth Street, New York.*

Q. S. BACKUS,

Sole Manufacturer of the

BACKUS

Patent

Bit Braces,

Angular

Borers,

Ratchet

and

Straight

Extensions,

&c.

Comprising every grade of quality and finish, from the cheapest Farmers' Brace to the finest Steel Sweep, heavily nickel plated, with rose-wood handles and lignum vitæ heads, being the most complete line offered by any manufacturer in the country, and which for simplicity of construction and effectiveness have no equal. Catalogues and price lists furnished upon application at office and salesroom,

No. 102 Chambers Street, NEW YORK.

NAT'L BOLT AND PIPE MACHINERY CO.,

Proprietors of National Head,

Mfrs. of Hand and Power Bolt and Pipe Cutters,

Bolt Pointers, Bolt Headers, Nut Machinery, Hot and Cold-Pressed Taps and Dies, &c.

Send for Circular, **Cleveland, Ohio.**

NATIONAL Horse Nail Co.

MANUFACTURERS OF

FINISHED

[BRIGHT OR BLUED]

These nails are made of the best brands of **NORWAY IRON,** and are guaranteed to be equal to any in the market.

NATIONAL HORSE NAIL CO.,
VERGENNES, VT.

HORACE DURRIE & CO., Agents,
No. 97 Chambers St., New York

PUTNAM'S HOT FORGED & HAMMER POINTED Horse Shoe Nails.

TRADE MARK.

Made from the best of Norway Iron.

The only *hot forged* machine made Horse Shoe Nail in the world that is *not sheared or cut* on the point. Warranted *never* to *split* or *silver* in the driving, and to hold the shoe *longer* than any other Nail. For sale by the hardware and iron trade generally.

PUTNAM NAIL CO.,
P. O. Address, Neponset, Mass. **BOSTON.**

ANVIL NAIL CO.

We desire to call the attention of the trade to our new manufacture of

Steel Horse Shoe Nails,

made from metal prepared in the Martin-Siemens Furnace by our PATENT process, which produces a nail having all the requisites for a

PERFECT HORSE SHOE NAIL.

The well-known desirable properties of a perfect nail are, that the POINT should be sharp, the SHANK stiff, to drive without crippling under the hammer, SOFT enough to clinch readily, while sufficiently tough to avoid all danger from the "drawing the clinch" or breaking the neck under the head. These properties we claim for the

"ANVIL HORSE NAILS."

In the process of manufacture the metal is compressed under the head, which gives the nail great strength where it is required (between the shoe and hoof), and the cold rolling gives it a stiffness attained in no other way, while the quality of the metal used insures a clinch and point unsurpassed by any nail ever offered in the market.

Samples and prices sent on application.

ANVIL NAIL CO.,
65, 67 and 69 Washington St., New York.

A. F. PIKE

East Haverhill, - New Hampshire,

Manufacturer and Wholesale Dealer in

Scythe, Axe, Knife and Hacker

STONES.

Factories at Haverhill and East Haverhill, N. H., and Evansville and Westmore, Vt.

Genuine OLD RELIABLE,
INDIAN POND (Red Ends),
LETOILE,
LAMOILLE,
DIAMOND GRIT,
UNION,
WHITE MOUNTAIN,
PREMIUM,
GREEN MOUNTAIN,
MOWING MACHINE,
RAGG.

Stones gotten up and labeled in any style desired.

PRICE and QUALITY GUARANTEED.

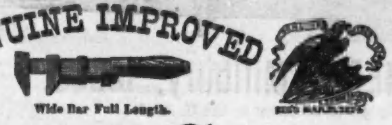
All the above Stones are of good keen grit and *will not glaze.*

Established in 1839. Formerly L. & A. G. Coes.

L. COES & CO.

Manufacturers of L. Coes'

GENUINE IMPROVED AND MECHANICS



Wide Bar Full Length. Wide Bar Full Length.

Patent Screw Wrenches

UNDER PATENTS DATED

JUNE 26, 1866, NOVEMBER 10, 1863,
MARCH 23, 1869, FEBRUARY 23, 1864,
REISSUED 1870. REISSUED JUNE 1, 1869,
IMPROVED AUG. 1, 1877.

The back thrust when in use borne by the SHANK instead of the Handle.

None genuine unless stamped "L. COES & CO."

WORCESTER, MASS.

Warehouse, 97 Chambers St., & 81 Reade St., N. Y

HORACE DURRIE & CO., Sole Agents.

These Axes Made from Firth's Best English Cast Steel.

HORACE DURRIE & CO.
Agents, - - New York.

The 1879 Pennsylvania Lawn Mower.

LIGHT DRAFT AND EASILY ADJUSTED.

Every Machine Warranted to Work as Represented.

Points Claimed as being Meritorious:

1. Lightness, combined with Strength in Construction.
2. Easiness of Adjustment.
3. Easiness in Securing and Adjusting the Handle
4. The Least Liability to Obstruction from Clogging, either in short or (for a Lawn Mower) high Grass.
5. Lightness or Easiness of Running while being worked.
6. The Attractive Appearance of the Machine.

It is the lightest machine in use, and all that is necessary to satisfy our customers of its superiority is to place it in competition with *any other machine* in the town in which they may reside.

PRICE LIST.

Width of Cutter.	Style. Driving Wheels.	Power required.	Weight.	Price.
10 inch.	8 inch.	A Child.	30¾ lbs.	$14.00
12 "	8 "	A Lad.	33½ "	18.00
14 "	8 "	A Lady.	36 "	20.00
16 "	8 "	One Man Size.	38 "	22.00
18 "	8 "	" "	41 "	24.00

NEW MACHINES.

15 inch, 10½ inch Driving Wheels, 6½ inch Cylinder, Man Size, 48 lbs. $22.00
17 inch, 10½ inch Driving Wheels, 6½ inch Cylinder, Man Size, 51 lbs. 24.00

GENERAL AGENTS:

LLOYD, SUPPLEE & WALTON, 625 Market Street, Philadelphia.
HORACE DURRIE & CO., 97 Chambers and 81 Reade Streets, N. Y.

The American Machine Co.,

MANUFACTURERS OF

And Other

HARDWARE SPECIALTIES.

OFFICE & FACTORY, 1916 to 1924 N. Fourth St., Philadelphia, Pa

NEW YORK BRANCH, 136 Chambers Street, - WM. H. BRAMHALL, Manager.

ESTABLISHED IN 1859.

THE IRONMONGER AND METAL TRADES ADVERTISER

PUBLISHED EVERY SATURDAY.

THE OLDEST AND CHIEF REPRESENTATIVE OF THE IRON, HARDWARE AND METAL TRADES.

OFFICE: 44a CANNON STREET, LONDON, E. C.

ADVERTISEMENTS AND SUBSCRIPTIONS ARE RECEIVED AT THE VARIOUS OFFICES OF "THE IRON AGE," NAMELY:

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SPECIAL FEATURES.

Notes of Novelties.—This is a department of the journal always watched with interest by the trade, as it contains an account, from week to week, of the novelties which manufacturers and inventors are introducing to the notice of the trade. These articles are freely illustrated.

Special Correspondents.—The *Ironmonger* has a deserved reputation for its special correspondence from all the principal Continental, British and manufacturing centers. The writers are gentlemen holding important positions in the districts with which they are connected, and possess facilities for acquiring information specially suited for the columns of the *Ironmonger*. *The Week, Legal News, Trade Notes, Bankruptcies, Foreign Notes, Colonial Jottings, Merchants' Circulars, Imports and Exports, &c.*, are each departments of the journal, containing a digest of all matters of direct interest to the Iron, Hardware and Metal Trades. In addition to the above, there is a carefully classified list of Patents, together with Editorial Notes, French, Belgian and other Special Correspondence.

SUBSCRIPTIONS

to the *Ironmonger and Metal Trades' Advertiser*, with which is sent every fourth week the Foreign Supplement (see below), may commence from any date, but are not received for less than a year complete. The rate is $5 per annum, inclusive of postage to any part of the world outside Great Britain. To every subscriber is presented, free, in the course of his year, a handsome and useful *Ironmongers' Diary and Text Book*, a work sold to non-subscribers at 75 cents.

ADVERTISEMENTS

are inserted in the *Ironmonger and Metal Trades Advertiser* at the subjoined rates, from which no variation can be made on any ground whatever.

Size of Page—Nine Inches Deep by Six Inches Wide.

One Advertisement of every Series of 13 Monthly, 27 Fortnightly, or 53 Weekly, will be inserted in the Ironmongers' Diary and Text Book, published toward the end of each year, and presented to every Subscriber.

	53 INSERTIONS, each net.	27 INSERTIONS, each net.	13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.	2 INSERTIONS, each net.	1 INSERTION, net.
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SPECIAL ISSUES.

In April and October of each year there is published a Special Issue, the circulation of which is not less than **Twelve Thousand (12,000)** copies.

THE IRONMONGERS' DIARY AND TEXT BOOK.

This is an annual, **presented free to every subscriber to the IRONMONGER AND METAL TRADES' ADVERTISER.** It contains a large number of ruled skeleton pages for diary and other entries, and in addition much useful reference information, varied from year to year. It is handsomely bound in cloth, gilt; and as copies are used in thousands of establishments for a whole year, it is obviously a medium of exceptional value for advertisements. Sold to non-subscribers at 75 cents.

THE FOREIGN SUPPLEMENT

Is published every fourth week in connection with the extensive and world-wide circulation of the *Ironmonger* itself. The dates of its publication in 1879 will be as follows:

JANUARY 11, FEBRUARY 8, MARCH 8, APRIL 5, MAY 3 and 31, JUNE 28, JULY 26, AUGUST 23, SEPTEMBER 20, OCTOBER 18, NOVEMBER 15, DECEMBER 13.

This Supplement is published in

FIVE LEADING COMMERCIAL LANGUAGES

of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the *Ironmonger* not only within reach but in the native language of eighty millions of *German*, forty-two millions of *French*, twenty-eight millions of *Italian*, and fifty-one millions of *Spanish* speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to be found.

Advertisements are inserted in *any* language at the following

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Size of Page—13¼ Inches Deep by 9½ Inches Wide.

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One-third page	12.50	14.10	15.65
Quarter page	10.00	11.25	12.50
One-sixth page	7.50	8.45	9.40
One-eighth page	6.20	7.00	7.75
One-sixteenth page	3.20	3.40	4.00

Advertisers will do well to use Illustrations freely. Where economy of space is an object, a left page illustrated and described, in one language, can be suitably described in four or more languages on the opposite or right page without illustrating.

THE WHOLE FOREIGN HARDWARE TRADE,

so far as our experience of twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List or Advertisement inserted in the *Ironmonger* and FOREIGN SUPPLEMENT is a strikingly powerful and most efficient way of publicity, not to be compared with any of the other ordinary channels of communication.

The Iron Age Directory

and Index to Advertisements.

HENRY DISSTON & SONS

KEYSTONE SAW, TOOL, STEEL and FILE WORKS,

Front and Laurel Streets, Philadelphia,

MANUFACTURERS OF

SAWS OF ALL KINDS, FILES AND TOOLS, AND SPECIAL GOODS MADE FROM SHEET STEEL.

All goods stamped Henry Disston & Sons, and bearing our trade mark, are fully warranted.

Branch Works, Tacony, Philadelphia. **Branch House, Randolph & Market Streets, Chicago. Ill.**

NEW EXCELSIOR LAWN MOWER

Received the Highest Award at the Centennial Exposition.

Important Features

FOR THE

SEASON OF 1879:

REDUCTION IN PRICE,

Three Styles Hand Mowers:

ROLLER,

BACK WHEEL and SIDE WHEEL.

Less Weight

Lighter Draft.

We now manufacture three styles of Hand Lawn Mowers, viz., Roller, Side Wheel and Back Wheel, as well as our well-known Horse Lawn Mower, and desire to call them to the special attention of the trade, both domestic and export.

Our Mowers are in practical operation on the public parks of New York, Brooklyn, Boston, New Haven, Cleveland, Chicago, and on almost all the prominent city parks in the United States and Canada.

We have received many first premiums in competitive trials with other Mowers, both in this country and abroad.

We make of Hand Lawn Mowers, seven sizes of the Roller Mowers, six sizes of the Side Wheel, and five sizes of the Back Wheel Mower, and four sizes of the Horse Lawn Mowers.

Our new Horse Mower is conceded to be the **lightest** and **best** Horse Lawn Mower ever made.

N. B.—Horse and Hand Lawn Mowers are alike guaranteed in all respects.

Address Send for Circulars.

CHADBORN & COLDWELL MFG. CO., Newburgh, N. Y.

Steam and Frost prevented on Show Windows.

REVOLVING VENTILATORS

For everything (and every size), from a hat or cap to an exhibition building.

Kitchens, Laundries, &c., ventilated without draft. Durable, strong, without rivets or solder. Oiled for six months. Each one has storm cap. Retail price, size six inch diameter, $1.00 and upwards; apparatus with which any one can cut circles in glass, 15 cents each.

Protective Ventilators avoid drafts, exclude dust, dampness, malaria and germs of disease; adopted by hospitals, schools, institutions, &c.; applied to any window or room.

Prof. A. L. LOOMIS, M. D., University of City of New York, writes as follows:

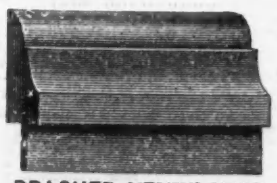
"From my personal experience and that of my patients who have used your Ventilator during the past six months, I am convinced that your method of removing dust, impurities and dampness from the atmosphere is the best which has as yet been proposed. By it the air in an apartment can be constantly changed without causing drafts. I would especially recommend its adoption in sick rooms, sleeping apartments, nurseries and school rooms."

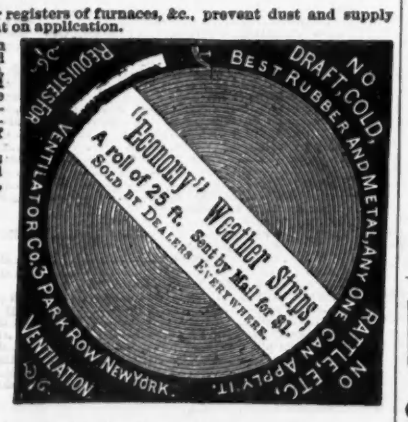
Air Filters and Moisteners, placed over hot-air registers of furnaces, &c., prevent dust and supply *steam filtered air.* Prices and discounts to the trade sent on application.

The "**Economy**" Molding Weather Strip is perfect in every respect. By enlarging edge of rubber or felt, and making slot in molding to correspond (see engraving), we save all *after expense* of molding. Once purchased it will last a lifetime, because rubber, etc., has only to be removed by taking old piece out of either end of molding, and sliding in a new piece. By this method of securing rubber all uncertainty of *fastening* or *undoing* of glue or tacks is overcome.

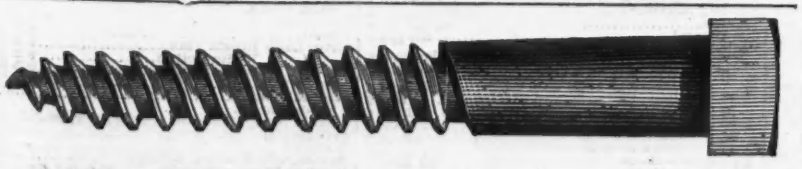
Rubber supplied with enlarged edge and instructions to enable Car Manufacturers, Carpenters, Builders and far off trade to make slots in Sashes, Doors, Moldings, &c., and thus make perfect Weather Strips.

No. 6.





BRACHER VENTILATOR CO., No. 3 Park Row, New York.



WM. H. HASKELL & CO.

Pawtucket, R. I.,

MANUFACTURERS OF

COACH SCREWS

(With Gimlet Points),

ALL KINDS OF

Machine and Plow Bolts,

FORGED SET SCREWS,

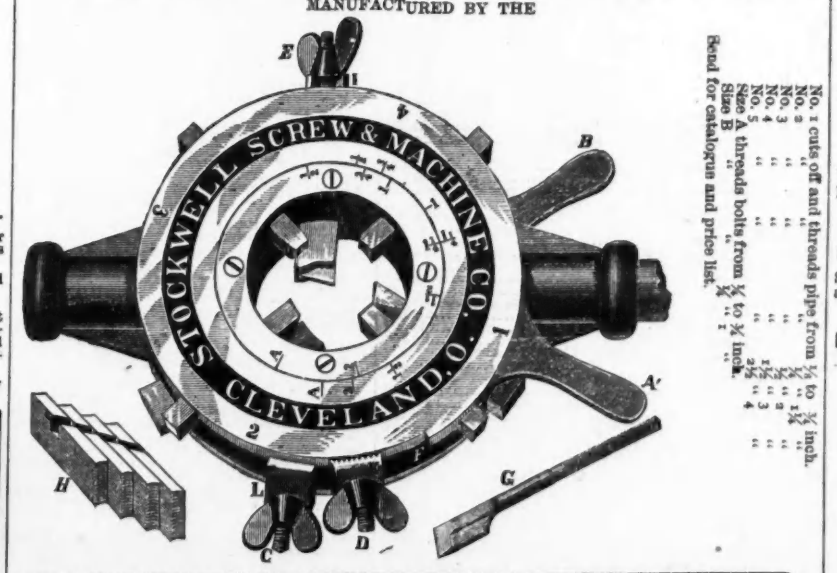
AND

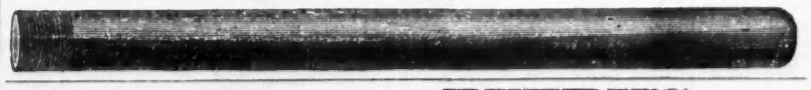
TAP BOLTS.

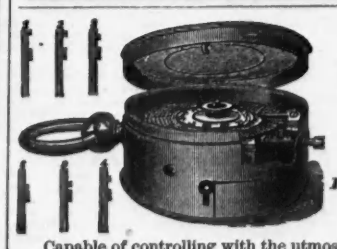
HENRY B. NEWHALL 11 WARREN ST. N NEW YORK AGENT

MAGIC SCREW PLATE.

MANUFACTURED BY THE







BUERK'S Watchman's Time DETECTOR.

IMPORTANT FOR ALL LARGE CORPORATIONS AND MANUFACTURING CONCERNS.

Capable of controlling with the utmost accuracy the motion of a watchman or patrolman as the same reaches different stations of his beat. The instrument is complete in itself, portable and as reliable as the best lever watch. It requires no fixture or wires communicating from room to room, as is the case with the ordinary watch clocks. A small, inexpensive stationary key is alone required at each station. The instrument will, in all cases, be warranted perfect and satisfactory.

N. B.—The suit against Imhaeuser & Co., of New York, was decided in my favor, June 10, 1874. Another suit has been decided against them and a fine assessed Nov. 11, 1876, for selling contrary to the order of the Court. Persons using clocks infringing on my Patent will be dealt with according to law.

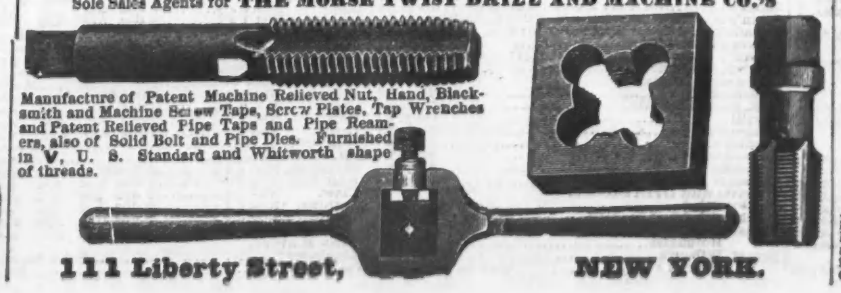
J. E. BUERK, Proprietor,

P. O. Box 979. *No. 230 Washington Street, Boston.*

☞ In sending for circular or ordering the above, please mention this paper.

H. S. MANNING & CO.,

Sole Sales Agents for **THE MORSE TWIST DRILL AND MACHINE CO.'S**



Manufacture of Patent Machine Relieved Nut, Hand, Blacksmith and Machine Screw Taps, Screw Plates, Tap Wrenches and Patent Relieved Pipe Taps and Pipe Reamers, also of Solid Bolt and Pipe Dies. Furnished in V, U. S. Standard and Whitworth shape of threads.

111 Liberty Street, **NEW YORK.**

Bergen Port Spelter.

MINES: Lehigh Valley, Pa. WORKS & FURNACES Bergen Port, N. J.

The only Miners and Manufacturers of

PURE LEHIGH SPELTER,

From Lehigh Ore.

Warranted free from any trace of Lead, and especially adapted for

Cartridge Metal and German Silver.

Also manufacturers of

BERGEN PORT OXIDE ZINC,

Superior for LIQUID PAINT on account of its body and wearing properties.

F. OSGOOD & CO., Proprietors.

E. A. FISHER, Agent, 13 Burling Slip, N. Y.

A. B. GUNNISON,

MANUFACTURER OF

WOOD PUMPS

ERIE, PA.

ESTABLISHED, - 1856.

Warranted Genuine Cucumber Pumps & Pipe.

Also Poplar Pumps, Lined Pumps, etc.

The Trade Supplied by

H. B. GRIFFING,
60 Cortlandt St., N. Y.

P. MANN,
Washington, D. C.

—AND BY—

A. B. GUNNISON
Manufacturer, ERIE, PA.

METALLIC SHINGLES.

We call the attention of all parties interested in Roofing, and the owners of large buildings, to the above article. It is superior to slate, cheaper, fire proof, about one-fourth the weight, lays much closer, therefore is storm proof, cannot crack, &c. Any carpenter can put them on. Send for description and Price List to Iron Clad Manufacturing Co., 50 Greenpoint Av., Brooklyn, E. D.
P. O. Box, 2526, N. Y. City.

GEORGE W. BRUCE,

1 Platt St., New York,

Agent for CLEMENT & MAYNARD'S Trowels, Hoes, Shovels, Spades and Scoops. Their Trowels and Hoes have entirely supplanted the English by their quality and cheapness, while all their goods compare advantageously with those of other makers and are largely exported.

New York Wholesale Prices, February 26, 1879.

HARDWARE.

Anvils.
Eagle Anvils (American) ... ⅌ lb 9c dis 20 %
Wright's ... ⅌ lb 10¼c over 250 lbs 10½c
Armitage's Mouse Hole ... 9¾ @ 10c
Trenton ... 10c
Augers and Bits.
Conn. Valley Mfg. Co.
Douglass Mfg. Co.
Ives
Beecher (French, Swift & Co) } dis 50 @ 55 %
Griswold
Nobles Mfg. Co.
Kasson's Patent
Cook's, Douglass Mfg. Co ... dis 50&5 %
Cook's, Ives' ... dis 45&10 %
Snell Mfg. Co.'s C. S. Augers ... dis 50&10 %
" " B. Machine ... dis 50 %
" " C. S. Bits ... dis 40 %
" " Jenning's Bits ... dis 35 %
Russell Jennings' Auger, Dowel, Machine-Dowel and Hand-Rail Bits ... dis 10&10&10 %
Russell Jennings' Augers ... dis 16⅔&10&10&10 %
Russell Jennings' Car and Machine Bits, Boring-Machine and Millwrights' Augers. dis 25&10&10&10 %
Imitation Jenning's Bits ... dis 35@40 %
Ives' "Jennings" Bits ... dis 20&10 %
Lewis' Single Twist Bits ... dis 40 %
Andrews Bits ... dis 50 %
Griswold's Patent Bits ... dis 30 %
Expansive Bits, Clark's, small, $18; large, $26. dis 20 %
" " Ives' ... $20 @ $30—dis 33⅓ %
" " Blake's ... $20—dis 40 %
" " Parmelee's ... $20 and $30. dis 33⅓ %
Hollow Augers Ives' } dis 40 %
" " French, Swift & Co. }
" " Bonney's Adjust., ⅌ doz $48—dis 25&10 %
" " Stearns' Adjust., ⅌ doz $48—dis 25&10 %
" " Ives' Expansive ... each $4.50—dis 40 %
" " Univ'sal Expansive, each $4.50—dis 20 %
Gimlet Bits ... $7.50 ⅌ gross, dis 45 %
" Diamond ... ⅌ doz $1.00 dis 25 %
" "Bee" ... dis 25&10 %
Double Cut Gimlet Bits Shepardson's ... dis 40 %
" " Ct. Valley Mfg. Co ... dis 30&10 %
" " Hartwell's ... dis 50 %
" " Douglass' ... dis 40 %
" " Ives' ... dis 50&10 %
Rowe's Bit Stock Drill, List of May 15, '78 ... dis 25 %
L'Hommedieu's Ship Augers ... dis 15 %
Watrous Ship Augers ... dis 15 %
Awl Hafts.
Sewing, Brass Ferrule ... $3.50 ⅌ gross—dis 40&10
Peg, " ... 3.50 " dis 40&10 %
Patent Sewing, Short ... $1.00 ⅌ doz—dis 40&10 %
" " Long ... $1.40 ⅌ doz—dis 10 %
" Peg, Plain Top ... $10.00 ⅌ gross—dis 40&10 %
" " Leather Top ... 12.00 " dis 40&10
Awls, Brad Sets, &c.
Awls Sewing, Common ... ⅌ gross $1.35—dis 25
" Sewing, Best ... ⅌ gross 1.40—dis 10 %
" Shouldered Peg ... ⅌ gross 2.25—dis 15 %
" Patent Peg ... ⅌ gross .60—dis 15 %
" Shouldered Brad ... ⅌ gross $2.70—dis 25&10 %
" Handled Brad ... $7.00 ⅌ gross—dis 25&10 %
" Handled Scratch ... $7.00 ⅌ gross—dis 25&10 %
" Socket Scratch ... $1.00@$1.25 ⅌ doz—net
Brad Sets, Aiken's ... ⅌ doz $12.00—dis 40&10 %
No. 42, $10.50; No. 43, $12.50 ... dis 60 %
Stanley's Excelsior, No. 1, $9.60 ... dis 25&10 %
" " No. 2, 4.80 ... dis 25&10 %
" " No. 3, 7.80 ... dis 25&10 %
Axes. Light. Med. Heavy.
H. H. Jones & Co ... $8.00 $8.50 $9.00 ⅌ doz net.
Axles.
Common (Guy C. Hotchkiss, Field & Co.) ... ⅌ lb 3½c
Solid Collar, Case Hardened, Chilled Box ... ⅌ lb 8c
Axle Grease.—Frazer's ... ⅌ lb 6c
Balances.
All Spring Balances ... dis 25&10 %
Bells.
Hand Light Brass ... dis. 75 @ 75&5 %
" Extra Heavy ... dis 40&5&10 %
" White Metal ... dis 60&5&10 %
" Silver Chime ... dis 20&10 %
" Swiss ... dis 25 %
" Globe (Cone's Patent) ... dis 25&10 %
Gong, Abbe's ... dis 20&10 %
" Yankee ... dis 30&10 %
" Barton's ... dis 40&2 %
Crank, Taylor's ... dis 25&10 %
" Brook's ... dis 50 %
" Cone's ... dis 10 %
" Connel's ... dis 50&10 %
Lever, Sargent's, new list Dec., '78 ... dis 60&10 %
" Taylor's Bronze or Plated Lever ... net
" " Japanned Lever ... dis 25&10 %
" Hart, Bliven & Mead Mfg. Co ... dis 50&10&2 %
Pull, " " ... dis 50&10&2 %
" Brook's ... dis 50 %
" Western ... dis 25&10 %
Call ... dis 20 @ 25 %
Cow, Common Wrought ... dis 20&10 %
" Western ... dis 20&10 %
" Sargent's ... dis 60&10 %
" Kentucky "Star" ... dis 20&10 %
" " Sargent's ... dis 60&10 %
" Dodge's Genuine Kentucky, new list—
Nos. 0 1 1½ 2 3 4 5 6 Hog } dis
$12.00 10.00 9.00 8.00 6.00 5.00 3.50 2.50 5.00, } 50&10 %
" Yaw's Genuine ... dis 50 %
" Texas ... dis 40&10 %
" Wilson's Moore's) ... dis 50 %
Bellows.
Blacksmiths', Common ... dis 45 %
" Extra and Pittsburgh Pattern ... dis 20 %
Moulders ... dis 25 %
Hand Bellows ... dis 20 %
Belting, Rubber.
N. Y. Belting and Packing Co. Fine Para (Best) to 36 in ... dis 30 @ 40 %
N. Y. Belting and Packing Co. Standard to 36 in ... dis 50 @ 60 %
Bit Holders.
Extension, Barber's ... ⅌ doz $15.00—dis 40&5 %
" Ives' ... ⅌ doz $15.00—dis 40 %
Diagonal ... ⅌ doz $24.00—dis 40 %
Angular ... ⅌ doz $24.00—dis 40 %
Blind Adjusters.—Domestic ... ⅌ doz $3.00, dis 20 %
Blind Fasteners.—Mackrell's ... dis 30 %
Van Sand's ... No. 2000, per gross, $7.00 @ 7.50, net
" old pattern ... ⅌ gross, $10.50, dis 20&10 %
Washburn's Patent ... ⅌ gross $14.00, dis 25 @ 30 %
Merriman's ... new list net
Blind Staples.
Boardman's Patent, ½ in. and larger ... ⅌ lb 15c net
" ⅜ in ... ⅌ lb 20c dis net
Blocks.—Burr & Co ... dis 25 %
Differential Pulley Blocks ... dis 20 %
Penfield Block Works, Rope and Iron Strap'd. dis 40 %
" " Wrot. Iron Com. bushed. dis 30 %
" " all steel roll'r. dis 15 %
" " Sheaves ... dis 30 %
Stanley R. & L. Co., Rope and Iron Strap'd. dis 35&10 %
Bolts.
Cast Iron Barrel, Shutter, &c ... dis 65&10 %
Cast Iron Chain (Sargent's list) ... dis 65&10 %
Bush's Lever and Chain Bolts ... dis 40, 10&10 %
Wrought Iron Barrel ... dis 60&10 %
" " Square ... dis 60&10 %
" " Shutter (Stanley's list) ... dis 50 %
" " " (Sargent's list) ... dis 50, 10&10 %
" " Sunk Flush, Sargent's ... dis 50&10&10 %
" " " Stanley's ... dis 25&10 %
" " B.K. Flush, Com'n, Stanley's. dis 50&7½ %
" " " Ex. Heavy, " dis 40&10 %
" " Plated Knob & Slide Flush " dis 50&10 %
Carriage and Tire, Common ... dis 75&3 % cash
" " Norway Iron ... dis 70 %
" " R. B. & W ... (old list) dis 70&5 %
" " Philadelphia ... dis 70 %
" " Coleman ... dis 60&10 @ 60&20 %
" " Shelton's ... (old list) dis 70&5 %
Tire. Am. Screw Co.'s, Phila ... dis 70&5 @ 70&10 %
" "Bay State" ... dis 75&10 @ 80 %
Star (Phila) ... dis 60&10@60&20 %
Stove—American Screw Co.'s ... dis 55&5 @ 60 %
" R. B. & W ... dis 50&10&5 %
Plow ... dis 50 %
Machine ... dis 70&5 %
Bolt Ends ... dis 60 %
Borax ... 10@11c ⅌ lb net
Boring Machines. Upright. Angular.
First quality, no Augers ... $5.50 $7.50 dis 40&10 %
" with Augers ... 0.00 11.00 dis 40&10 %
Second quality, no Augers .. 2.35 3.00 net
" with Augers 4.00 4.65 net
Snell's, no Augers ... 4.75 6.25 dis 40 %
Phillips' with Augers ... . 0.00 dis 3?
Bow Pins.
Hotchkiss' ... low list dis 10 %
Humason, Beckley & Co.'s ... dis 60 %
Sargent & Co's ... $10.70 and $21.40, dis 60&10 %
Braces.—Barber's Patent ... dis 40&5 %
O. S. Backus ... dis 50&10 %
Wilson Mfg. Co ... dis 10 %
Spofford's Patent ... dis 50&5 %
Noble's Patent ... dis 40&5 %
Ives' "Centennial" ... dis 50 %
Common Ball (American) ... dis 35 @ 40 %
Brackets.—Shelf (Sargent's). dis 60&10 @ 60&10&10 %
Swing (T. & S. Mfg. Co.) ... dis 33⅓ %
Bright Wire Goods ... dis 70&10 %
Bull Rings.—Union Nut Co ... dis 50&20 %
Sargent's ... dis 66⅔&10 %
Hotchkiss' ... low list dis 10 %
Humason Beckley & Co.'s ... dis 60 %
Butts.
Wrought Brass ... dis 60 %
Cast Brass, Tiebout's ... dis 40 %
" Corbin's ... dis 50&10 %
COMMON CAST, NOT DRILLED.
Fast Joint, Narrow ... dis 60&10 %
" Broad ... dis 65&10 %
Loose Joint, Narrow and Broad ... dis 70&10 %
Parliament Butts ... dis
Mayer's Hinges ... dis
DRILLED AND WIRED.
Fast Joint, Narrow ... dis 55&10 %
" Broad ... dis 60&10 %
" Broad, Japanned ... dis
Loose Joint } ... dis 70&10 %
" Japanned }
" with Acorns }
Parliament Butts ... dis 62½&10 %
Mayer's Hinges ... dis 72½&10 %
Loose Pin no Acorn ... dis 75&10 %
" Acorns ... dis 70&10 %
" " Japanned ... dis 75&10 %
" " Plated Tips ... dis 70&10 %
Union Mfg. Co.'s Fancy Butts—
Figured Enameled Loose Joint ... dis 65&10 %

Boston Finish, Plain ... dis 80&10 %
" " with Iron Acorns ... dis 75&10 %
" " with Silvered Acorns ... dis 70&10 %
WROUGHT IRON.
Fast Joint Narrow ... dis 55 %
" Lt. Narrow ... dis 55 %
" Broad ... dis 50 %
Loose Joint, Broad ... dis 50 %
Table Butts, Back Flaps, &c ... dis 55 %
Inside Blind, Regular ... dis 55 %
" Light ... dis 55 %
Loose Pin, Wrt ... dis 55 %
Spring Hinges:
American Spiral Spring Butt Co., Jap'd ... dis 25 %
" " " Fancy ... dis 10 %
Geer's Single and Double Acting ... dis 25 %
Sabin Mfg. Co.'s Double Acting ... dis 35 %
Centennial, Japanned ... dis 25 %
" Ornamental ... dis 20 %
Union Spring Hinge Co.'s ... dis 25 %
American Spring Hinge Co.'s ... dis 25 %
Union Mfg. Co ... dis 25 %
Bommer's ... dis 25 %
Blind Butts, Parker ... dis 75&10 %
" Palmer ... dis 40&5&10 %
" Seymour ... dis 65&10&10 %
" Shepard ... dis 70&10 %
" Lull & Porter ... dis 66⅔&10 %
" Nicholson ... dis 45&10 %
" Huffer ... dis 40&10 %
" Clark's, Nos. 1, 3, 5, 40 and 45 ... dis 75&10 %
" Buffalo "Noiseless" ... dis 75&10 %
" Sargent's ... dis 70&10&10 %
Butchers' Cleavers.
Humason & Beckley Mfg. Co ... dis 20 %
D. R. Barton Tool Co ... dis 20 %
Bradley's ... dis 25 %
Beatty's ... dis 25 %
1 2 3 4 5 6 7 8
$16.50 19.00 21.50 24.00 27.00 30.00 33.50 36.50
Hart Mfg. Co ... dis 50&10 %
0 1 2 3 4 5 6
$20.00 26.00 29.50 33.00 37.00 41.50 45.00
Can Openers.
Messenger's Comet ... ⅌ doz $3.00, dis 20 %
American ... ⅌ doz $2.25, dis 70 %
Lyman's ... ⅌ doz $3.75, dis 20 %
Poole ... ⅌ doz $3.75, dis 40 %
No. 4, French ... ⅌ doz $2.25, dis 50@55 %
No. 5, Iron Handle ... ⅌ doz $0.75 net
Eureka ... ⅌ doz $2.50, dis 10 %
Sardine Scissors ... ⅌ doz $7.00, dis 55 %
Star ... ⅌ doz $5.00, dis 25 %
Caps—Percussion, ⅌ 1000.
Hicks & Goldmark's G. D. & S. R ... 35c
" " E. B. 1-10 Ground ... 70c, dis 5 %
" " E. B. 1-10 Turned ... 65c, dis 5 %
" " D. W. P. 1-10 ... $1.40, dis 5 %
" " D. W. P. ¼ ... 1.35, dis 5 %
" " Colt's 1-10 ... 70c, dis 5 %
F. L ... 50c, dis 5 %
Ely's E. B ... 1-10s, 65 @ 68c
" Double Waterproof, ... 1-4s, $1.50; 1-10s, $1.58c
Colt's ... 1-10s, 80c
Cartridges.—Metallic ... dis 60&7 %
Cards.—Horse and Curry ... dis 33⅓&10 %
Cotton ... dis 25&10 %
Wool ... dis 25&10 %
Car Pusher.—"Giant" ... $6.25 each, dis 20 %
Carpet Stretchers.
Cast Steel, Polished ... ⅌ doz $5.00, dis 30 %
" Iron Steel Points ... ⅌ doz $2.00, dis 45&5 %
Casters.
Bed ... dis 55 %
Plate and Shallow Socket ... dis 55 %
Deep Socket ... dis 40 %
Cattle Leaders.
Hotchkiss' Sons' ... dis 10&10 %
Humason, Beckley & Co.'s ... dis 60 %
Sargent's ... dis 60&10&10 %
Chain.
Trace, 6½-1-2 ... by the cask, ⅌ pair 45 @ 46c
" 6½-10-3 ... by the cask, ⅌ pair 43 @ 44c
" 7-10-2 ... by the cask, ⅌ pair 40 @ 50c
German Halter Chain ... dis 40&10 %
" Coil ... dis 40&10 %
Galvanized Pump Chain ... ⅌ lb 10½c dis 10 %
Jack Chain, Iron ... dis 60&10 %
" Brass ... dis 55&10 %
Chalk.
White ... ⅌ gross 55c net
Red ... ⅌ gross 75c net
Blue ... ⅌ gross 00c net
White Crayons ... ⅌ gross 14½c net
Chisels.
D. R. Barton Tool Co. (all kinds) ... dis 20 %
Socket Framing, Crossman ... dis 70 @ 70 & 5 %
" " Buck Bros ... new list. dis 25 %
" " Merrill ... dis 70 %
" " Witherby Tool Co ... dis 70 %
" " Douglass' ... dis 70 %
" Firmers, Crossman ... dis 70 %
" " Buck Bros ... new list. dis 25 %
" " Merrill ... dis 70 %
" " Witherby Tool Co ... dis 70 %
" " Douglass' ... dis 70&5 %
" Corner ... dis 65@70 %
Tanged Firmers extra ... dis 40 %
" " Butcher's ... $5.00 @ $5.25 to £
" " Spear & Jackson's ... 5.00 to £
" " Buck Bros (Shank) ... 5.00 to £
Clamps.
Iron, Providence Tool Co.'s, Wrt. Iron ... dis 25 %
" Adjustable, Gray's ... dis 20 %
" " Lambert's ... dis 20 %
" " Snow's ... dis 40&5 %
" " Hammer's ... dis 15 %
" " Stearns' ... dis 15&10 %
" Cabinet, Sargent's ... dis 60&10&10 %
" Carriage Makers', Sargent's ... dis 60&10&10 %
" Cord and Tape (T. & S. Mfg. Co.) ... dis 30 %
Clips, Axle.
Norway or Best ... dis 60 %
Superior ... dis 60&10 %
Cockeyes ... 1¼ in., 28c.; 1⅜ inch, 33c.; 1¾ in., 37c, net
Cocks, Brass.
Racking, new list ... dis 50 %
Globe, " ... dis 50 %
Plain Bibbs, " ... dis 50 %
Ale and Beer, new list ... dis 50 %
Coffee Mills.
Board and Box ... dis 20@25 %
Increase Wilson's ... net
Selsor's Pat ... $9.50, $10.50, dis 25 %
American (Enterprise Mfg. Co.) ... dis 20 %
French Steel ... dis 20 %
The Swift (Lane Bros.) ... dis 25 %
Combined Dinner Pail and Lantern.
⅌ doz $15.00 ... dis 30 %
Compasses, Dividers, &c.
Compasses ... dis 45 %
Callipers ... dis 45&10 %
Dividers ... dis 55 %
Bemis & Call Co.'s Dividers ... dis 60&20 %
" " Compasses & Callipers ... dis 55 %
" " Wing & Inside or Outside. dis 50&5 %
" " Double ... dis 60 %
" " Call's Pat. Inside ... dis 35&10 %
Cook's ... dis 15 %
Excelsior ... dis 50 %
Miller's Patent ... dis 25 %
Coopers' Tools.
Bradley's ... dis 15 @ 20 %
D. R. Barton Tool Co ... dis 20 %
Corkscrews.—Humason & B ... dis 33⅓ %
Corn Knives and Cutters.—Bradley's ... dis 10 %
Crow Bars.
Cast Steel ... ⅌ lb 9c net
Iron, Steel Points ... ⅌ lb 5c
Crucibles.—Gautier & Co ... ⅌ No. 5½c
Curling Irons, &c.
⅛, ⅝, ¾ in., $1.80, 2.00, 2.40 ... dis 10 %
Curling Tongs ... ⅌ doz $3.65, dis 10 %
Pinching Irons ... ⅌ doz 7.50, dis 20 %
Curry Combs.
Fitch's (List of No. 240, $1) ... dis 45 %
Hotchkiss' & Kellogg's, Iron & Brass, old list. dis 4 &7½ %
Hotchkiss' Novelty ... dis 20&10 %
Rubber ... ⅌ doz $9.00, dis 20&10 %
Curtain Pins.—Silvered Glass ... dis 15 %
White Enamel ... dis 15 %
Cutlery.
Meriden Cutlery Co. (Table) ... net
Am. Miller Bro.'s Cutlery Co ... dis 25 %
Humason & Beckley, Pocket ... dis 25 %
Naugatuck Cutlery Co ... list net
Dog Collars.
Embossed Gilt ... dis 20 %
Leather ... dis 30 %
Brass ... dis 25 %
Door Springs.
Torrey's Rod ... ⅌ doz $1.75 net
Gray's " ... ⅌ doz $1.65, net
Gem (Coil)—
No. 1, Large, Japanned ... ⅌ doz $3.50 }
No. 2, Medium, " ... ⅌ doz 2.50 } dis 10 %
No. 3, Small, " ... ⅌ doz 2.00 }
Challenge (Coil)— Nos. 9 7 6
Japanned ... ⅌ doz $2.00 2.50 3.50 }
Coppered ... ⅌ doz 4.00 4.50 5.00 } dis 30 %
Galvanized ... ⅌ doz 3.50 4.00 4.50 }
Nickeled ... ⅌ doz 5.50 6.00 7.00 }
Premium (Coil)— Nos. 1 2 3
Japanned ... ⅌ doz $7.50 6.25 5.00 } dis 30 %
Nickeled ... ⅌ doz 11.00 9.50 8.00 }
Star (Coil)—For Cop'd, Nickel-Plated, &c., see list.
No. 4, ("Shoo Fly") Screen door size ⅌ doz $1.80 }
No. 5, Screen Door Size ... ⅌ doz $2.00 } dis 30 %
No. 6, Medium ... ⅌ doz 2.50 }
No. 7, Large ... ⅌ doz 3.50 }
Sabin's Lever.. No. 1, $1; 2, $1.50; 3, $2; 4, $2.50; dis 30 %
Sabin's Boss ... ⅌ doz $4.20, dis 40&10 %
Philadelphia ... 5 in., $5.00; 8 in., $7.00, dis 35 %
Barker's Concealed ... dis 30 %
Cowell's ... No. 1, $18.00; No. 2, $15.00 ⅌ doz, dis 50 %
Rubber, complete ... ⅌ doz $1.90, net
Drawing Knives.
Crossman's No. 1 ... dis 70 %
D. R. Barton Tool Co ... dis 20 %
Merrill ... dis 70 %
Nobles Mfg. Co ... dis 15 %
Bradley's ... dis 35 %
Adjustable Handle ... dis 20 %
Witherby Tool Co ... dis 70 %
Douglass ... dis 70 %
Drills and Drill Stocks.
Blacksmiths' ... each $1.80 net
Blacksmiths' Self Feeding ... each $7.50, dis 10 %
Breast, P. S. & W ... dis 25 %
" Hotchkiss ... dis 20 %
Breast, Wilson's ... dis 20 %
" Miller's Falls ... each $2.50, dis 25 %

Ratchet, Merrill's ... dis 25 %
" Ingersoll's (old list) ... dis 35 %
" Whitney's ... dis 30 %
" Weston's ... dis 20 %
" Moore's Triple Action ... dis 20 @ 25 %
Whitney's Hand Drill ... dis 20&10 %
Wilson's Drill Stocks ... dis 10 %
Automatic Boring Tools ... each $2.75, dis 30 %
Drill Chucks.—Morse's Beach Patent ... dis 30 %
" Adjust. each $10.00, dis 20 %
Danbury ... $8.00, dis 30 %
Egg Beaters.
Dover ... ⅌ doz $5.00, dis 20 %
Family ... ⅌ doz $3.00 net
National ... ⅌ doz $4.50, dis 33⅓ %
Elevator Buckets.
Mill E. Buckets, light, 3½ to 10 in., (Duc's Improved) ⅌ 100 $15.00 @ $54.00, net
Mill E. Buckets, heavy, 5 to 10 inches (Duc's Improved) ⅌ doz $5.60 @ $10.20, net
Storehouse, (Duc's Patent) 12 to 17, $12.00 @ $20.00 ... net
Emery and Emery Paper.
Genuine Chester—Regular Nos ... ⅌ lb 6c
" " Flour and FF ... ⅌ lb 5c
" " in 10-lb. cans ... 2c extra
Washington Mills—Regular Nos ... ⅌ lb 8c
" Flour ... ⅌ lb 5c
Wellington Mills, Grain ... ⅌ lb 10c net
" Flour ... ⅌ lb 8c net
Hampden Emery Grain ... 50 net
" " Flour ... 30 net
B. & A. Emery Paper ... dis 20 %
Enameled and Tinned Ware.
Kettles ... dis 45 %
Sauce Pans ... dis 35 %
Tinned Sauce Pans ... dis 35 %
Escutcheon Pins.
Iron ... dis 33⅓
Brass ... dis 40
Escutcheons.
Door Lock ... Same discounts as Door Locks
Brass Thread ... dis 60&10 %
Wood ... dis 25 %
Faucets.
Fenn's ... dis 50 %
Fenn's Cork Stops ... dis 40 %
Star ... dis 55&10 %
Frary's Patent Petroleum ... dis 20&10 %
Wood and Metallic ... dis 40 %
West's Patent Key ... dis 40 %
Metallic Key, Leather Lined ... dis 50&10 %
Cork Lined ... dis 70&10 %
Enterprise (Self Measuring) ... ⅌ doz, $36.00, dis 20 %
Felloe Plates ... ⅌ lb 15c, dis 50 %
Files.
American File Co ... $5.00 to £, dis 35 %
Auburn ... $5.00 to £, dis 35 %
Arcade ... $5.00 to £, dis 35 %
G. & H. Barnett ... dis 25 %
Nicholson ... (Nicholson List) dis 35 %
Heller & Bros ... $5.00 to £ dis 25 %
Madden & Cockayne File Co ... $5.00 to £, dis 25 %
Jowitt's ... $4.50 to £
J. & Riley Carr ... 4.50 to £
Stubs' ... $7.00 @ 7.50 to £
Butcher's ... 4.50 to £
Walter Spencer & Co.'s "Diamond" ... 4.50 to £
Fisher's ... 4.75 to £
Moss & Gamble ... 4.50 to £
H. Disston & Sons (new list) ... dis 35 %
Limet & Co. (French) ... $4.25 to £
Fluting Machines.
Knox, 4-inch Rolls ... $2.50 each net
" 6 " ... 3.00 each net
" 8 " ... 5.00 each net
Peerless, 4-inch Rolls ... 4.00 each net
" 5 " ... 4.75 each net
Eagle, 3½-inch Roll ... $1.62½ each net
" 5½ " ... $2.12½ each net
Eureka, No. 1, 7-inch Roll ... 6.50 each, dis 33⅓ %
" No. 2 5-inch Roll ... 5.50 each, dis 33⅓ %
Crown ... 4½-in., $2.62½; 6-in., $3.00; 8-in., $5.00 each net
Star ... 4½ in., $3.50; 6 in., $4.00 each net
Crown Jewel ... 6 in., $2.50 each net
Domestic Fluter ... 1.50 each net
Geneva Hand Fluter
Shepard Hand Fluter ... No. 75 ⅌ doz $15, dis 10 %
" No. 104, ⅌ doz $12.00 net
Clark's Hand Fluter ... ⅌ doz $15.00, dis 20 %
Combined Fluter and Sad Iron ... ⅌ doz 15.00, dis 30 %
Buffalo ... ⅌ doz 10.00, dis 10 %
Fluting Scissors ... dis 45&10 %
Forks.
Hay, Manure and Spading ... new list. dis 15 %
Plated "A 1, Rogers & Bro ... dis 40&5 % cash
" Reed & Barton ... dis 40&5 %
Fruit and Jelly Presses.
Enterprise Mfg. Co ... dis 20 %
Fry Pans.
Burnished, list as follows ... dis 60&5 %
No ... 0 1 2 3 4 5 6 7 8
⅌ doz ... $3.00 $3.75 4.25 4.75 5.25 6.00 7.00 8.00 9.00
Acme Patent, same list as above ... dis 45 %
Gauges.
Marking, Stanley's ... dis 50&10 %
" Chapin's ... dis 50&10 %
" Star ... dis 35 %
Wire ... dis 10 %
" Smith's Patent ... ⅌ doz $18.00, dis 40 %
Gimlets.
Nail and Spike ... dis 50 %
"Bee" Gimlets ... ⅌ gross $12.00, dis 45 %
"Eureka" Gimlets ... dis 50 %
"Diamond" Gimlets ... dis 20&10 %
Double Cut, Shepardson's ... dis 40 %
" " Hartwell's ... dis 50 %
" " Ives' ... dis 55 %
" " Douglass' ... dis 40 %
Glue Pots.
Tinned and Enameled ... dis 45 %
Family, Howe's "Eureka" ... dis 30 %
" L. F. & C.'s "Handy" ... dis 40 %
Grindstone Fixtures.
Sargent's Patent ... dis 70&10&10 %
Reading Hardware Co ... dis 40&10&2 %
" "Keystone" ... dis 45&10&2 %
Hammers.
Maydole's, New List of Dec. 10th, 1878 ... dis 15 %
Cheney's, List January, '79 ... dis 20 %
H. Hammonds ... dis 20 %
Verree ... dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 and 1.75. dis 25&10 %
Warner & Noble's ... dis 10 %
Kip's (new list, Dec. '78) ... dis 25 %
Hand Cuffs and Leg Irons.
Providence Tool Co.'s Hand Cuffs, $15.00 ⅌ doz } dis 10 %
" " Leg Irons, $25 ⅌ doz }
Tower's ... dis 25 %
Handles.—Door or Thumb Latches—
Nos ... 0 1 2 3 4
Per doz ... $0.80 1.00 1.18 1.35 1.50 ... dis 70 %
Roggin's Latches ... per doz 30 @ 33c net
Bronzed Iron Drop Latches ... ⅌ doz 70 @ 85c net
Jap'd Store Door Handles—Nuts, $1.40; Plate $0.95
no Plate, 75c ... net
Barn Door ... per doz $5.00, dis 65&10&10 %
Wrought Chest ... dis 60&5&10 %
Surface Chest, Sargent's list ... dis 65&10 %
Flush Chest ... dis 60&10&10 %
Lifting ... dis 60&10 %
Saw and Plane ... dis 40&10 %
Hammer and Hatchet ... dis 20 %
Brad Awl ... ⅌ gross $2.00, dis 25&10 %
Hickory Firmer Chisel, assorted, ⅌ gross $4.50 }
" " " large, " 5.00 }
Apple " " assorted, " 5.00 }
" " " large, " 6.00 }
Socket " " assorted, " 3.00 } dis 25&10 %
" Framing " assorted, " 5.00 }
File, assorted, ⅌ gross ... 2.75 }
Auger, assorted, ⅌ gross ... 0.00 }
" large, " ... 7.00 }
Patent Auger, Ives' ... dis 25&10 %
" Douglass' ... ⅌ set $1.25, dis 10 %
" Swan's ... ⅌ set $1, dis 20&10 %
Hangers.
Barn Door ... dis 70&10 @ 75&10 %
Novelty ... dis 40 %
Challenge ... dis 50 %
Climax (Anti-Friction) ... dis 50&10 %
Sterling Improved (Anti-Friction) ... dis 75&10 %
Cheritree ... dis 20 %
Harness Snaps.
Henshaw's ... List of 1⅛ changed to $14.00, dis 55 %
Judd's ... " " 14.00, dis 55 %
Fitch's (Bristol) " 14.00, dis 55 %
Hotchkiss' ... dis 10 %
Andrews' ... dis 50 %
Sargent's ... dis 66⅔&10 %
New York Wire ... dis 20&20 %
"German" ... dis 70 %
Hatchets.
Isaiah Blood ... dis 30 %
Shingling, Nos. 1 2 3 ... ⅌ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 ... ⅌ doz 7.75 8.50 9.25
Lathing. Nos. 1 2 3 ... ⅌ doz 7.50 8.00 8.50
Hunt's ... dis 25 @ 30 %
Shingling, Nos. 1 2 3 ... ⅌ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 ... ⅌ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 ... ⅌ doz 7.50 8.25 9.00
Hurd's ... dis 45 %
Shingling, Nos. 1 2 3 ... ⅌ doz $8.00 $8.50 $9.00
Claw, Nos. 1 2 3 ... ⅌ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 ... ⅌ doz 8.00 8.50 9.00
Simmon's ... dis 35 %
Shingling, Nos. 0 1 2 3 ... ⅌ doz $7.50 $8.00 $8.50 $9.00
Claw, Nos. 1 2 3 ... ⅌ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 ... ⅌ doz 8.00 8.50 9.00
Broad, Nos. 1 2 3 4 ... ⅌ doz 9.00 10.00 12.00 14.00
" Nos. 5 6 7 8 ... ⅌ doz 16.00 18.00 20.00 22.00
Collins ... dis 10 %
Shingling, Nos. 1 2 3 ... ⅌ doz $6.00 $6.50 $7.00
Claw Nos. 1 2 3 ... ⅌ doz 6.50 7.00 7.50
Lathing, Nos. 1 2 3 ... ⅌ doz 6.00 6.50 7.00
D. R. Barton Tool Co. (Solid Steel) ... dis 20 %
Shingling, Nos. 1 2 3 ... ⅌ doz $11.00 $10.50 $10.00
Lath, Nos. 1 2 3 ... ⅌ doz 10.50 10.00 9.50
Half Hatchets. Nos. 1 2 3 ... ⅌ doz 11.00 10.50 10.00
D. R. Barton Tool Co ... dis 35 %
Shingling, Nos. 1 2 3 ... ⅌ doz $8.50 $8.00 $7.50
Claw, Nos. 1 2 3 ... ⅌ doz 9.50 9.00 8.50
Half, Nos. 1 2 3 ... ⅌ doz 8.50 8.00 7.50
Lath, Nos. 1 2 3 ... ⅌ doz 8.50 8.00 7.50
Hunters' ... ⅌ doz 10.00
M. H. Jones & Co ... dis 40 %
Shingling, Nos. 1 2 3 ... ⅌ doz $8.00 $8.50 $9.00
Half Hatchets, Nos. 1 2 3 ... ⅌ doz 8.00 8.50 9.00
Claw, Nos. 1 2 3 ... ⅌ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 ... ⅌ doz 8.00 8.50 9.00
Broad, Nos. 2 3 4 ... ⅌ doz 11.00 12.00 14.50
" Nos. 5 6 7 ... ⅌ doz 16.50 18.00 19.50
Hay Knives.
"Lightning" ... ⅌ doz $20.00 net
Wadsworth's ... dis 30 %

Hinges.
Gate, Western ... ⅌ doz $6.25, dis 60&10 %
" N. E ... ⅌ doz $10.13, dis 60&5&10 %
" N. E. Reversible ... ⅌ doz $6.50, dis 60&10 %
Gate, Clark's No. 1 ... ⅌ doz $6.00, dis 50&10 %
" N. Y. State ... ⅌ doz $7.20, dis 60&10 %
" Automatic ... ⅌ doz $12.50 dis 40 %
" Common Sense ... dis 20 %
" Seymour's ... dis 40&10 %
" Shepard's ... No. 25 ⅌ doz $6.00, dis 50 %
Rolled Blind Hinges ... dis 60&10 %
Rolled Plate ... dis 70&10 %
Rolled Raised ... dis 70&10 %
Wrought Strap and T, list Dec. 20, '77 ... dis 60&10 %
Plate Hinges { 6 to 10 in. 5½c ⅌ lb } ... dis 10 %
"Providence" { over 10 in. 4½c ⅌ lb }
Screw Hook and Strap { 8, 10, 12 in., 11c; 14 to 36 in., 9½c } dis 50&10 %
Heavy Welded Hook { 8 to 12 in., 11c; 14 in. & up, 9½c } dis 30 %
Screw Hook and Eye { ⅝ & 1 in., 10c; ¾ in., 12c; ½ in., 14c; ⅜ in., 16c } dis 35 %
Hoes.—Solid Shank, C. S ... ⅌ doz $5.25, dis 15 %
Socket ... ⅌ doz 5.75, dis 15 %
Riveted Shank ... ⅌ doz 3.25 dis 15 %
Grub ... dis 30 %
Planters' ... dis 30 @ 35 %
Scovill Pattern ... dis 25 @ 30 %
Scovill Pattern, Handled ... dis 25 %
Hick's Pat. Solid C. S. Planters' ... dis 20&10 @ 30 %
" " Scovill Pattern dis 20&5 @ 35 %
Winsted & Lane, Planters ... dis 25@30 %
" " Scovill Pattern ... dis 20@25 %
Hooks.
Bird Cage, Sargent's list ... dis 70 %
Cotton ... dis 50 %
Cotton (Humason & Beckley Mfg. Co.) ... dis 25 %
Belt, (new list) ⅌ c ... dis 30&10 %
Bench—Hotchkiss', $5.00 ⅌ doz ... dis 10 %
" Weston's, No. 1, $10.00; No. 2, $9.00 ⅌ doz dis 25 %
" McGill's, $3.00 ⅌ doz ... dis 10 %
" Skinner's, $6.25 per doz ... dis 20 %
Clothes Line, Hart's list ... dis 60&10&5&10 %
" Sargent's list ... dis 66⅔&10 %
" Reading list ... dis 45&10&2 %
Ceiling.. { Hart's list ... dis 70&10 %
Harness. { Sargent's list ... dis 70&10 %
{ Reading list ... dis 45&10&2 %
Coat and Hat, Hart's list ... dis 65&5&10 %
" Sargent's list ... dis 66⅔&10 %
" Reading ... dis 45&5&10&2 %
" T. & S. Mfg. Co's list ... dis 25 %
Tassel (T. & S. Mfg. Co.) ... dis 40 %
Wrought Staples and Hooks and Staples, dis 75&10 @ 80 %
" Staples, Stanley's list ... dis 40 %
Wire Screw Hooks and Eyes ... dis 70&10 %
Grass and Bush ... dis 40 %
Whiffletree—Patent ... dis 40 %
Hooks and Eyes—Malleable Iron ... dis 60&10&10 %
" Brass ... dis 60&10&10 %
Horse Nails
Nos. 5 6 7 8 9 10
Ausable ... ⅌ lb 30c 27c 25c 24c 23c 22c } dis
" Finished, Polished or Blued ... " 31c 28c 26c 25c 24c 23c } 20 %
Bridgewater Iron Co. Nos. 5 6 7 8 9 10
Pointed and Polished 26c 23c 21c 20c 19c 18c
Nos. 5 6 7 8 9 10
Cortland P't'd & Blued.. 26c 23c 21c 20c 19c 18c
Globe (New list).. Nos. 5 6 7 8 9 10
26 23 21 20 19 18c net
H. P. Pointed and Finished 26 23 21 20 19 18 } dis 20 %
North Western Fini'h'd 26 23 21 20 19 18c net
" " Plain 25 22 20 19 18 17c net
National, Pointed and Polished, Pat. Fin ... 25 23 22 21 20c net
Putnam Hammer, P't'd 26 23 21 20 19 18c net
Vulcan P't'd & Blued. 26 23 21 20 19 18c net
Horse Shoes.—Burden ... ⅌ keg $3.62½
R. I. Horse Shoe Co., Perkins' Improved Light, Medium and Heavy ... ⅌ keg 3.62½
Mule Shoes ... ⅌ keg 4.62½
Perkins' Snow ... ⅌ keg 4.12½
Ice Awls, Chisels, &c.
American Ice Chisel ... ⅌ doz, $6.00 dis 45 %
National " ... ⅌ doz $6.25 dis 20 %
Novelty Ice Breakers ... ⅌ doz $6.25 dis 20 %
White's Sliding Head Picks ... ⅌ doz $2.50 dis 40 %
Dunlap's Ring Picks ... ⅌ doz $3.00, dis 25 %
Wood Head Picks, Sargent's ... ⅌ doz $1.85, dis 60&10 %
Iron ... ⅌ doz 1.85, dis 60&10 %
Ice Mallets Pick in Head ... ⅌ doz 2.75 net
" Pick in Handle ... ⅌ doz 3.00 net
Ice Axes, Small Cast or Malleable ... ⅌ doz 1.25 net
Kitchen Ice Tongs ... ⅌ doz 2.25 net
Combination Ice Tools ... ⅌ doz $2.50 dis 30&10 %
Kettles.
Brass, 7 to 13 inches inclusive ... ⅌ lb 35c net
Brass, larger than 13 inches ... ⅌ lb 40c net
Enameled ... dis 45 %
Knives.
Ames' Butcher Knives ... dis 20 %
" Shoe ... dis 15 %
" Bread ... ⅌ doz $1.50, dis 15 %
Moran's Shoe and Bread Knives ... dis 20 %
Hay and Straw—"Wadsworth's" ... dis 30 %
Table and Pocket ... See Cutlery
Knobs.
Carriage (Jap'd 80c. ⅌ gross) ... dis 60&10 %
Base—Common ... dis 30&10 %
" Elastic End. No. 8 ... dis 70 %
Hemacite Door Knobs ... dis 35 %
Door, Mineral } Same discounts as Door Locks.
" Por. Jap'd }
" " Plated }
" " Por. }
Furniture, Plain ... 75c gross inch, dis 10 %
" Wood Screws ... dis 20 %
Picture (T. & S. Mfg. Co.) ... dis 50 %
" Sargent's ... dis 60&10 %
Hemacite Picture ... dis 35 %
Shutter, Porcelain ... dis 60&10 %
Ladles.
Melting—Hart's ... dis 55&10 %
" Sargent's ... dis 50&10 %
" Reading ... dis 15&10 %
" Monroe's Patent ... ⅌ doz $4.00, dis 20 %
Lanterns.
Tubular ... No. 0, $10.00; No. 1, $11.50 } net
With Guards, 50c extra. }
Hurricane ... dis 25 %
Peerless ... No 5, ⅌ doz $11.75, dis 10&10 %
Brady's Patent ... dis 10&10 %
Ætna ... dis 10&10 %
Yankee ... dis 10&10 %
De Beque ... dis 10&10 %
Police.. Small, $7.50; Med., $9.00; Large, $12.00, dis 20&10 %
Convex Reflector ... $3.60 ⅌ doz, dis 10 %
Lemon Squeezers.
Porcelain Lined ... ⅌ doz $4.00 net
Eureka, Tinned ... ⅌ doz $8.00, dis 10 %
Dunlap's Improved ... ⅌ doz $4.00 net
Sammis' ... No. 1, $7.50; No. 2, $12.00 ⅌ doz., dis 40 %
Townsend's Patent ... $6.00 ⅌ doz., dis 33⅓ %
Lines.—Linen Fish ... dis 25 %
Cotton Chalk ... dis 50 %
Sil. Lake Chalk ... Nos. 0, 1, 2, 3, $6.00, $6.50, $7.00, $7.50 ... dis 20 %
Mason's Linen ... dis 20 %
Wire Clothes, Galvanized ... each 30 @ 40c net
Locks and Latches.
Cabinet—Eagle }
" Gaylord } ... dis 25&2 %
" Bridgeport }
" Barnes & Deitz ... dis 30 %
Trunk ... dis 25 %
Langstroth & Crane's List Jan. 1, '77.
Round Key ... dis 40&10 %
Flat Key ... dis 33⅓&10 %
Barnes & Deitz, Flat Key ... dis 30 %
Yale Lock Co., Flat Key ... dis 40 %
Shepardson's, Flat Key ... dis 35 %
American Lock Mfg. Co ... dis 33⅓ %
Plate ... dis 33⅓&5&2 %
F. Many's "Extension Cylinder" ... $10.50 ⅌ doz, net
DOOR LOCKS, &c.
Branford ... dis 60&10&2 %
Norwalk ... dis 50&10&2 %
Norwich ... dis 50&10&2 %
Russell & Erwin ... dis 70&2 %
Mallory, Wheeler & Co ... dis 35&10&2 %
Reading Hardware Co ... dis 35&10&2 %
Trenton ... dis 40&5&2 %
Continental ... dis 33⅓ %
Padlocks—Russell & Erwin } ... dis 33⅓&5 %
" Mallory, Wheeler & Co } and 2 % for cash
" Wm. Wilcox & Co }
" American Lock Mfg. Co ... dis 33⅓ %
" Romer's ... dis 30 %
" Conestoga ... dis 60 %
" J. H. McWilliams ... dis 10 %
" Barnes & Dietz ... dis 30 %
" Penn Lock Works ... dis 30 %
Mallets.—Hickory and Lignumvitæ ... dis 10&10 %
Meat Cutters.
Dixon's (P. S. & W.) Nos. 1 2 3 4
⅌ doz ... $14.00 17.00 19.50 30.00—dis 25
Miles' Challenge ... Nos. 1 2 3
⅌ doz ... $22.00 30.00 40.00—dis 30 %
Perry's Nos. 1 2 3 4 4 g'rd 5 g'rd
Each ... $3.00 4.00 5.00 11.00 13.00 30.00—dis 40 %
Woodruff's (P. S. & W.) ... Nos. 100 150
⅌ doz ... $15.00 18.00—dis 40
Hales' ... Nos. 11 12 13
⅌ doz ... $33.00 40.00 51.00—dis 50&2 %
Draw Cut ... Nos. 5 2 6 8 10
Each ... $50.00 75.00 80.00 225.00 400.00—dis 20 %
American ... dis 25 %
Nos ... 1 2 3 4 B 5
Each ... $5.00 7.00 10.00 25.00 50.00 60.00
Mincing Knives.
Am., 1 blade, $16; 2 blades, $27; 3 blades, $37 per gross ... dis 15@20 %
Molasses Gates.
Stebbins Pattern ... dis 62½&10 %
" Genuine ... dis 60&10 %
" Tinned Ends ... dis 40&10 %
Chase's Hard Metal ... dis 30 %
Bush's ... dis 20 %
Lincoln's Genuine ... dis 62½&10 %
Weed's ... dis 15 %
Nails ... See Trade Report
Nuts and Washers.
Square Nuts ... 7c off list
Hexagon Nuts ... 8c off list
Washers ... 7c off list
Nut Crackers
Table (Humason & Beckley Mfg. Co.) ... dis 33⅓ %
Blake's Pattern ... ⅌ doz $2.00, dis 10 %

Oakum.
Best ... ⅌ lb
U. S. Navy ... ⅌ lb
Navy ... ⅌ lb
Oilers.—Zinc and Tin ... dis 55
Brass and Copper ... dis 55
Olmsted's ... dis
Broughton's ... dis
Malleable (Hammer's) ... ⅌ doz $5.00, dis
Prior's Patent or "Paragon" ... dis 50&10
Ox Balls ... dis 60&10
Pencils.
Faber's Carpenters' ... dis
" Round Gilt ... ⅌ gross $5.25
Dixon's Lead ... ⅌ gross 4.00
" Lumber ... ⅌ gross 7.50
Packing, Steam.
N. Y. Belting and Packing Co. Best ... dis
" Rubber Back ... dis
Picture Nails and Knobs.
Brass Head, Sargent's List ... dis 50&10&5
" T. & S. Mfg. Co ... dis
Porcelain Head, Sargent's List ... dis 50&10&5
" " Judd's List ... dis
Porcelain Head, T. & S. Mfg. Co ... dis
Pinking Irons ... ⅌ doz 75c, net
Plaiting Machines.
Magic ... ⅌ doz $10.00, net
Astor Plaiting Machine ... each $15.00, dis
Crown Plaiting Machines ... dis
6in., $6.00 10in., $10.00, each.
Planes and Plane Irons.
Bench, First Quality ... dis 30&10
" Second " ... dis 50&10
Moulding ... dis 30&10
Bailey's (Stanley R. & L. Co.) new list Jan. '79. dis
The Stanley (S. R. & L. Co.) " dis
Bailey's "Victor" ... dis
Defiance Adjustable, new list ... dis
D. R. Barton Tool Co ... dis
Plane Irons, Butcher's ... $5.00 to £
" Buck Bros ... $5.00 to £
" Auburn Tool Co.'s ... dis
" Defiance ... dis
" D. R. Barton Tool Co ... dis
" Middletown Tool Co ... dis
" Ohio Tool Co ... dis
" Spear & Jackson's ... $5.00 to £
" Sandusky Tool Co ... dis 10&10&10
Pliers and Nippers.
Button's Patent ... dis 33⅓
Hull's Patent Nippers, No. 1, $15; No. 2, $21 ⅌ doz, dis
Humason & Beckley Mfg. Co ... dis 33⅓
Gas Pliers ... dis
Eureka Pliers and Nippers ... dis
Russell's Parallel ... dis
P. S. & W. Cast Steel ... dis
" End Cutting Nippers ... dis
" Tinners' Cutting Nippers ... dis
Plumbs and Levels.
Disston's ... dis
Stanley R. & L. Co.'s Pat. Adjustable ... dis 60&10
" " Non-Adjustable ... dis 65&10
Chapin's Patent Adjustable ... dis 65&10
" Non-Adjustable ... dis 65&10
Standard Rule Co.'s New Adjustable ... dis 60&10
" Non-Adjustable ... dis 60&10
Johnson's Patent Adjustable ... dis 60&10
Davis' Patent ... dis 60&10
Pocket Levels ... dis 65&10
Post Hole and Tree Augers.
Samson Post Hole Digger ... per doz $36.00, dis 25
Fletcher Post Hole Augers ... ⅌ doz 36.00, dis 25
Vaughan's Post Hole—
6 in. $23.60; 7, 8 and 9 in. $25 per doz ... dis
Leed's ... $5.00 each, dis 45
Eureka ... ⅌ doz $40.00, dis 40
Potato Parers, &c.
Bay State ... ⅌ doz $13.00 dis 25
Saratoga "Peeler and Slicer ... ⅌ doz 7.75 dis 25
Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw per doz $18.00, dis
" Pruning Hook ... " 11.50, dis
Pruning Shears ... ⅌ doz $5
Pulleys.
Judd's Axle ... ⅌ doz $0.50, dis
Hot House and Tackle ... dis 66⅔&10
Jap'd Screw ... dis 66⅔&10
Brass Screw ... dis 60&10
Jap'd Side ... dis 66⅔&10
" Clothes Line ... dis 66⅔&10
Hay Fork Solid Eye, $4.00; Swivel, $5.00, dis 10&10&10
" " "Anti-Friction," ... $7.50 dis
" " "F" Common and Pat. Bushed ... dis
" " Tarbox Pat. Iron ... dis
Shade Rack ... dis
Punches.
Bel's or Drive ... ⅌ doz $2.00; 2.25; 2.50, dis
Bemis & Call Co.'s Cast Steel Drive ... dis 40&5
" " Springfield Socket ... dis 50&10
Spring ... ⅌ doz $7.00, dis 45&10
" Leach's Patent ... dis 15
Bemis & Call Co's Spring and Check ... dis 33⅓
Solid, Tinners' ... ⅌ doz $1.44, dis 33⅓
Rail.
Sliding Door Wrought Brass ... ⅌ lb 38c dis 15
" " Iron, Painted ... ⅌ foot 9c, dis
Barn Door, ½, ⅝ and ¾ inch ... dis 75&10
" for N. E. Hanger ... dis 70&10
Rakes.
Cast Steel ... dis 15
8 10 12 14 16 teeth.
$5.00 5.75 6.50 7.25 8.00
Malleable ... dis 15
10 12 14 teeth.
$3.60 4.00 4.40
Razor Straps.
Genuine Emerson ... dis 33⅓
Badger's Emerson ... dis 33⅓
Badger's (not Emerson) ... dis
Evans' ... dis
Imitation Emerson ... ⅌ doz $2.75. dis 40&10
Hunt's ... dis 40&5
Chapman ... dis 15 @ 25
Torrey's ... dis
Saunder's ... dis 15 @ 15
Rivets.
Iron and Tinned ... dis 50
In bulk, new list of Jan. 10, 1878 ... dis
Copper Rivets and Burs ... dis 50
Nos.. 7 8 9 10 11 12 13 14 15
⅌ lb .. 49c 50c 52c 54c 56c 58c 60c 62c 70c
Tinned Iron Belt Rivets and Burs ... dis 45
Rivet Sets ... dis
Rods.
Stair ... dis 60&10
" American Patent ... dis
Rollers.
Barn Door, Sargent's list ... dis 70&10
Novelty ... dis
Acme (Anti-Friction) ... dis
Rope. Manufacturers' Net List, December, 1878.
Manila ... ½ inch and larger ⅌ lb
" ... ⅜ inch ⅌ lb
" ... ¼ and 5-16 inch ⅌ lb
" Tar'd Rope ... ⅌ lb
" Lath Yarn ... ⅌ lb
" Hay Rope ... ⅌ lb
Sisal ... ½ inch and larger ⅌ lb
" ... ⅜ inch ⅌ lb
" ... ¼ and 5-16 inch ⅌ lb
" Hay Rope ... ⅌ lb
Rules. Boxwood Ivory.
Chapin's } dis 70 &10 % } dis 60 &10
Standard }
Willis, Thrall & Son }
Stephens }
Stanley }
Sad Irons.
From 4 to 10 lbs ... ⅌ lb 2¾@2½c net
Self-Heating ... ⅌ doz $8.75 net
" Tailors' ... ⅌ doz $17.50 net
Gleason's Shield and Toilet ... dis 25
Enterprise Patent Cold Handle ... dis 33⅓
Mrs. Pott's Pat. Cold Handle, "Crown" ... dis 33⅓
Combined Fluter and Sad Iron .. per doz $15.00, dis 15
Sand Paper.
Baeder & Adamson's Flint, 00 to 1½ .. $4.25 ⅌ ream }
" " 2, 2½ & 3. 4.75 ⅌ ream }
" " Assorted 4.25 ⅌ ream } dis 20
" " Star ... 3.25 ⅌ ream }
" " Emery .. ⅌ ream $6.50 @ 11.50 }
New England, same list as B. & A. Flint ... dis 20
Gage's ... dis 20&5
Sash Cord.
Common ... ⅌ lb 16 @ 15c net
Patent ... ⅌ lb 18c net
Silver Lake Russia Flax ... ⅌ lb 55c net
" White Cotton ... ⅌ lb 55c net
" Drab Cotton ... ⅌ lb 60c net
Raw Hide ... dis 25
Steel Ribbon ... dis 25
Sash Locks.
Clark's, No. 1, $10.00; No. 2, $8.00 per gross ... dis 45@50
Ferguson's ... dis 33⅓
Walker's ... dis 25
Hammond's Window Springs ... dis 25
Northup Window Springs ... $9.00 per gross, dis 10
The Perfect, Clark & Smith, Plain Jap'd ⅌ gro $10.00 net
" " Por. Knob Jap'd. ⅌ gro 14.00 net
" " Nickel-Plated ... ⅌ gro 27.00 net
Sash Weights.—Solid Eyes ... ⅌ lb 1 @ 1½c
Sausage Stuffers or Fillers.
Miles ... ⅌ doz $20, dis 30
Perry ... ⅌ doz, No. 1, $15; No. 0, $21, dis 30
Draw Cut No. 4 ... each $30.00, dis 25
Enterprise Mfg. Co ... dis 25
Silver's ... dis 25
Saws.
Disston's Circular ... dis 35
" Mill ... dis 25
" Cross Cut ... dis 25
" Hand, Panel, Rip, &c ... dis 25
E. M. Boynton's Lightning, Cross Cuts ... dis 50&5 %
" One-Man, all lengths ... dis 40&5 %
" Billet Webs ... ⅌ doz $10, dis 40&5 %
Wheeler & Clemson Mfg. Co.'s Hand ... dis 35
" Cross-Cut ... dis 35
Livingston's Butcher and Kitchen ... dis 25
Framed Wood—
Nos ... 101 102 103 104 105
Per doz.. $10.00 8.[illegible] 10.00 7.50 6.25 net
Saw Frames.
White, Vermont ... ⅌ doz $1.35, dis 15
Red, Polished and Varnished ... ⅌ doz $2.00, dis 15
Saw Rods ... $10 list dis. 10&10
Saw Sets.
Boynton's Patent ... dis 40
Stillman's Genuine ... ⅌ doz $4.25 net
" Imitation ... ⅌ doz $3.25, dis 33⅓
Common Lever ... per doz $2.00, dis 33⅓

Leach's ... No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's ... No. 1, $8.50; No. 2, $5.50, dis 20&10 %
Hammer, Hotchkiss ... $5.50, dis 10 %
" Bemis & Call Co.'s New Pat ... dis 40&5 %
Bemis & Call Co.'s Lever & Spring Hammer. dis 35&10 %
" " Plate and Cross Cut ... dis 20 %
Aiken's Genuine ... $13.00, dis 50 %
" Imitation ... $7.00, dis 45 %
Hart's Patent Lever ... dis 20 %
Disston's ... dis 20 %

Scales.
Hatch, Counter ... ₩ doz $36, dis 40&2 %
" Tea ... ₩ doz $15.00 dis 50 %
Union Platform ... $6.00, dis 50&5 %
Turnbull's Market ... dis 20 %
Fairbanks' ... dis 20&5 %
Howe's ... dis 20&5 %
Chatillon's Grocers' ... dis 40 %
" Eureka ... dis 20 %
Family Universal ... dis 25 %
" Favorite ... dis 25 %
" Turnbull's ... dis 25 %
Scale Beams, Chatillon's list ... dis 25 %
" Sargent's list ... dis 60&10 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.), $6.50. dis 25&10 %
Box, 1 Handle ... ₩ doz $5.00, dis 10 %
" 2 " ... ₩ doz 6.00 dis 10 %
Defiance Box and Ship ... dis 25&10 %
Foot ... dis 60&10 %
Ship (common) ... per doz $3.00 net
" (Providence Tool Co ... dis 10 %

Screw Drivers.
Hart, Bliven & Mead ... dis 45&10&2 %
Douglass Mfg. Co ... dis 35&1 %
Disston's ... dis 52½ %
Disston's Patent Excelsior ... dis 52½ %
Buck Bros ... dis 25 %
Stanley Rule & Level Co., Varnished Hdls ... dis 50&10 %
" " " Black Handles ... dis 40&10 %
Sargent & Co.'s ... dis 60&10 %

Screws.
Flat H'd Iron ... dis 60 %
Round Head Iron ... dis 45 %
Flat Head Brass ... dis 45 %
Round Head Brass ... dis 30 %
Brass and Silver Capped ... dis 40 %
Japanned, list of Plain Screws ... dis 55 %
Lag or Common Coach ... dis 70&5 %
Coach Patent Gimlet Point ... dis 40 @ 45 %
Bed ... dis 10 %
Machine, Flat Head, Iron, Am. Screw Co ... dis 25 %
" Round Head, Iron, " ... dis 20 %
Bench, Iron ... dis 60&10 %
" Wood, Beach ... ₩ doz $3.00, net
" " Hickory ... dis 20&10 %
Hand ... dis 25&10 %
Hand Rail, Sargent's ... dis 60&10 %
" " Humason, Beckley & Co.'s ... dis 40&10 %
Jack (Wilson's) ... dis 35 %
Sash (T. & S. Mfg. Co.) ... dis 25 %

Shears and Scissors.
Cast Steel ... dis 80 %
" Iron, "American" ... dis 50 @ 55 %
Seymour's Straight Trimmers ... dis 65 %
" Scissors ... dis 65 %
Pruning ... see Pruning Hooks and Shears.
Barnard's Lamp Trimmers ... ₩ doz $3.75
Tinners' ... dis 20 %
Heinisch Trimmers and Scissors ... dis 60 %
" R. H. S. " " ... dis 65 %

Sheaves.
Sliding Door, M. W. & Co., list ... dis 35&10&2 %
" R. & E. list ... dis 50&2 %
" Patent Roller ... dis 25&2 %
" " Hatfield's ... dis 50&2 %
" Russell's Anti-Friction ... dis 50&2 %
" Moore's Anti-Friction ... dis 45 %
Sliding Shutter, R. & E. list ... dis 50&2 %
" " Sargent's list ... dis 55&10 %
Moore's Anti-Friction (Hanging) ... dis 45 %
Philadelphia Hanging ... dis 40&5&2 %

Shovels and Spades.
Ames, New list, Jan. 1, '79 ... dis 20 %
Kimball Shovel Co ... dis 20 @ 20&5 %
Old Colony ... dis 30 %
Remington's (Lowman's Patent) ... dis 30 %
Dunning's Shovels and Scoops ... dis 30&7½ %
R. Rowland's "Regular," new list ... dis 60 %
" " Patent, new list ... dis 40&5 %
Oxford Patent, new list ... dis 40&5 %

Shovels and Tongs.
Iron and Brass Head, R. & E. list ... dis 50&2 %
" " Hart's ... dis 50&10&2 %
Polished Steel ... new list, dis 50&10&2 %

Slates.
Square Frames, Round Cornered, by case ... dis 70 %
Less than a case ... dis 65&10 %

Spoke Shaves.
Defiance Metallic ... new list, dis 25&10 %
Iron ... dis 40&10 %
Wood ... dis 30 %
Bailey's (Stanley R & L. Co.) new list ... dis 25&10 %

Spoke Trimmers.
Bonney's ... ₩ doz $10.00, dis 40 %
Stearn's ... ₩ doz $10.00, dis 40 %
Ives' ... No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 40&10 %
Douglass' ... ₩ doz $9.00, dis 20&10 %

Spoons.
Tinned Iron ... dis 15 %
Basting ... dis 30 %
Britannia ... dis 60&10&10 %
Derby Silver Co ... dis 40&5&5 %
L Boardman's Sons, A1 ... dis 40&5&5 %
Rogers & Bro., A 1 ... dis 40&5 % cash
Reed & Barton ... dis 40&5 %
Hall & Elton ... dis 40&5 %
Holmes, Booth & Haydens ... dis 40&5 %
German Silver ... dis 30&10&5 %
Diamond Steel (L. Boardman's Sons) ... dis 30&5 %
Tin (P. S. & W.), Teas ... $1.50 ₩ gross, net
" " Tables ... $2.50 ₩ gross, net
Tin Cowles Hdw. Co.) ... dis 10 %
" " " case lots ... dis 20 %

Stocks and Dies. ... dis 5&10 %
"Lightning" Screw Plate ... dis. 10 %

Stone.
Hindostan Stone ... ₩ ℔ 6c }
" Ax Stone ... ₩ ℔ 8c } dis 30&10 %
" Slips ... ₩ ℔ 10c }
Sand Stone ... ₩ ℔ 6c, dis 30&10 %
Washita Stone ... No 1, ₩ ℔ 20c }
" ... No 2, ₩ ℔ 16½c }
" Slips ... No. 1, ₩ ℔ 45c } dis 10 %
Arkansas Stone ... No. 1, ₩ ℔ $1.00 }
" ... No. 1, ₩ ℔ $0.85 }
" Slips ... No. 1, ₩ ℔ $2.25 }
Turkey Oil Stone (Boyd & Chase) ... 4 to 8in, $1.00 ₩ ℔, dis 10 %
" Slips " ... $2.50 ₩ ℔, dis 10 %
Lake Superior (Boyd & Chase) ... ₩ ℔ 20c, dis 10&5 %
" " Slips ... ₩ ℔ 45c, dis 10&5 %
Grindstones, Family, Loring's ... dis 10 %

Stove Polish.
Joseph Dixon's ... ₩ gross $6.00, dis 5 %
Gem ... ₩ gross $4.50, dis 5 %
Gold Medal ... ₩ gross $6.00, dis 25 %
"Mirror" ... ₩ gross $6.00, dis 5 %
Ruby ... ₩ gross $3.75, net
Rising Sun ... ₩ gross $5.75, net

Squares.
Steel ... dis 50 %; full cases, dis 50&10 % } 2 % cash
Iron ... dis 50 %; full cases, dis 50&10 % }
Nickel Plated ... add $2.50 @ $4.00 ₩ doz, net
Try Squares and T Bevels ... dis 50&10 %
Star Try Squares and Bevels ... dis 35 %
Disston's Try Squares and T Bevels ... dis 52½ %
Winterbottom's Try and Mitre ... dis 25&10 %
Bailey's Try Squares and T Bevels ... dis 25&10 %

Tacks, Brads, &c.
List of May, 1878 ... dis 55 %
Shoe Nails, (new list) ... dis 10 %
Double-Pointed Tacks ... dis 40&5 %

Tap Borers.
Common and Ring ... dis 20&10 %
Ives' Tap Borers ... dis 10&10 %
Enterprise Mfg. Co ... dis 20 %

Tapes, Measuring.
American ... dis 25 %
Spring Tapes ... dis 25&10 %

Thermometers.
Tin Case ... dis 70 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion) ... dis 20 %
Wood Bottom ... ₩ doz $12.00, dis 30&10 %
All Iron ... ₩ doz $10.50, dis 40&5 %
Nashua Lock Co.'s ... ₩ doz $18.00, dis 50 %
Toe Calks.—Winsted ... ₩ ℔ 10c. dis 10 %

Tinners' Tools and Machines.
Machines (P. S. & W.) ... dis 5@10 %
Tools (P. S. & W.) ... dis 15@20 %

Traps.
Game, Newhouse ... dis 33⅓ %
" Newhouse Pattern ... dis 60&10 %
" Blake's Patent ... dis 40&10 %
Mouse, Wood, Choker ... ₩ doz holes, 12 @ 13c
" Round Wire ... ₩ doz $1.50, dis 10 %
" Cage " ... ₩ doz $2.50, dis 10 %
" Patent Self Setting ... ₩ doz holes, 25c, net
" Catch-em-alive ... ₩ doz $2.75, dis 10 %
Rat. "Decoy" ... per doz $10.00, dis 10 %

Trowels.
Lothrops Brick and Plastering ... dis 15 @ 20 %
Reed's Brick and Plastering ... dis 15 %
Disston's Brick and Plastering ... dis 20 %
Peace's Plastering ... dis 20 %
Clement & Maynard's ... dis 20 %
Rose's Brick ... dis 20 %
Brades' Brick ... gold, dis 20 %
Worrall's Brick and Plastering ... dis 20 %
Garden ... dis 50 %

Triers.
Butter and Cheese ... dis 25 %

Vises.
Solid Box, Trenton ... New List, Jan. 22, '79, dis 35 %
" Wilsons ... New List, Jan. 22, '79, dis 35 %
" "Crown" (A. H. Hildick's) 40 to 100 lbs., 15c currency ... dis 20 %
" Park, Long & Co., new list Jan. 22, '79. dis 35 %
" Peter Wrights ... 15¾c
Parallel, Parker's ... dis 20 %
" Wilson's ... dis 45 @ 50 %
" Howard's ... dis 25 %
" Merrill's ... dis 20 %
" Sargent's ... dis 60&10 %
" Trenton ... dis 25 %
" Backus and Union ... dis 25 %
" Fisher & Norris ... dis 15&10 %
" Stevens' ... dis 25 %
" Simpson's Adjustable ... dis 25&10 %
"Family," List ... net
Saw Filers, Bonney's ... ₩ doz $24.00, dis 20&10 %
" Stearn's ... dis 20&10 %
" Hopkins' ... ₩ doz $17.50 dis 10 %
Lowell Hand Vises ... dis 20 %
Richardson's Vise and Anvil ... dis 25 %

Ventilators.
Protective (upper) per foot, $1.00 } dis 25 %
" (lower) " 1.50 }

Washer Cutters.
Smith's Patent ... ₩ doz $12.00 dis 10 %
Johnson's ... ₩ doz $12.00, dis 20&10 %
Penny's ... ₩ doz $14.00 and $16.00, dis 35&10 %
Appleton's ... ₩ doz $8.00, dis 10&10 %
Washers.—See Nuts and Washers.

Weather Strips.
Protective Ventilator Co. s ... dis 25 %
Well Wheels.—Revised list ... dis 60&10 %

Wire.
Brass and Copper ... List of July 1, 1878 dis 10&10 %
Bright and Annealed ... Nos. 0 @ 18, dis 55 @ 57½ %
" " ... Nos. 19 @ 26, dis 60 @ 62½ %
" " ... Nos. 27 @ 36, dis 65 @ 67½ %
Coppered ... Nos. 0 @ 18, dis 50 @ 55 %
Galvanized, Nos. 0 to 6 ... ₩ ℔ 10c, dis 35 @ 37½ %
" Nos. 7 to 18 ... market list, dis 35 @ 37½ %
Tinned, Nos. 0 to 18 ... dis 42½ @ 47½ %
Cast Steel ... dis 25 @ 30 %
Tinned Broom Wire, Nos. 18 to 25 ... dis 50 @ 55 %
Annealed Fence, Nos. 8 and 9 ... dis 57½ @ 60 %
" Grape, Nos. 10 to 14 ... dis 57½ @ 60 %
Galvanized Telegraph, Nos. 7 to 9 ... ₩ ℔ 8½c
" Nos. 10 and 11 ... ₩ ℔ 9½c
" No. 12 ... ₩ ℔ 10c
Fence Staples ... ₩ ℔ 7 @ 7½c
" Staples, Galvanized ... ₩ ℔ 9½ @ 10c
Stubs Steel Wire ... $7.00 to £ gold
Japanned Barb Fence ... ₩ ℔ 15c
Galvanized " ... ₩ ℔ 16c
Steel Music Wire, Nos. 12 to 27 ... ₩ ℔ $1.00, net
Judd's Picture Wire ... dis 80&20 %
Clothes Line Wire, Galvanized ... ₩ coil 30 @ 40c net

Wrenches.
American Adjustable ... dis 45 %
Baxter's Adjustable "S," ... dis 20 %
" Diagonal ... dis 20 %
Collins & Co.'s ... dis 45 %
Coes' Genuine ... dis 60&10 %
" Pattern (Wrought) ... dis 70 %
" " (Malleable) ... dis 75&10 %
Girard ... dis 60&10&5 %
Davis' Patent Duplex ... new list, dis 25 %
Bemis & Call's Patent Combination ... dis 25 %
" " Merrick's Pattern ... dis 40&5 %
" " Briggs' Pattern ... dis 35 %
" " Cylinder or Gas Pipe ... dis 25&30 %
Aiken Pocket (Bright) ... $8.00, dis 55&10 %
The Favorite Pocket (Bright) ... per doz $8, dis 60 %

Wringers. Per doz.
Universal, Cog Wheels, No. 2½ ... $60.00
" " " No. 2 ... 63.00
" " " No. 1½ ... 71.00
Crown No. 2 ... 54.00
" No. 2½ ... 63.00
" No. 3 ... 69.00
Eureka, No. 1 ... 57.00
Novelty, No. 10, with Cog Wheels ... 60.00
" No. 2 ... 63.00
Excelsior, No. A, with Folding Bench ... 84.00
" No. E, for Set Tubs ... 66.00
Keystone No. 1, Wood Frame, no Gear ... 54.00
" No. 2, Iron " " ... 54.00
" No. 10, Wood " Common Gear ... 60.00
Peerless, No. 0, no Cogs ... 51.00
" No. 1, " ... 54.00
" No. 2¼, with Cogs ... 60.00
" No. 2, " ... 63.00
" No. 3, " ... 71.00
" No. 4, " ... 93.00

Stamped Tinware.—New List Dec. 1, 1878.
Common Stamped Ware ... dis 25 %
Stamped Deep and Retinned Ware ... dis 25 %

METALS.

IRON.—Duty: Bars, 1 to 1½c. ₩ ℔; Sheet, Band Hoop and Scroll, 1½ to 1⅞c. ₩ ℔; provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 ₩ ton; Polished Sheet, 3c. ₩ ℔; Wrought Scrap, $8 ₩ ton; Cast Scrap, $6 per ton. Railroad 70c. ₩ 100 ℔s. Boiler and Plate, 1½c. ₩ ℔.

Pig Iron—American.
Foundry No. 1 ... ₩ ton $16.50 @ 18.00
" No. 2 ... ₩ ton 15.50 @ 17.00
Gray Forge ... ₩ ton 16.00 @

Scotch.
Eglinton ... ₩ ton 19.50 @ 20.00
Coltness ... ₩ ton 22.00

Rails.
Iron, at mill ... ₩ ton $32.00 @ 35.00
Steel " ... ₩ ton 42.00 @ 43.00
Old Rails ... ₩ ton 20.00 @ 21.00

Scrap.
Wrought Scrap, from yard .. ₩ ton, nom. 21.00 @ 22.00

Bar Iron, from Store.
Common Iron:
¾ to 2 in. round and square } ₩ ℔ 1 75c
1 to 6 in.x⅜ to 1 in }
Refined Iron:
¾ to 2 in. round and square } ₩ ℔ 2.0c
1 to 6 in.x⅜ to 1 in }
1 to 6 in.x¼ and 5-16 ... ₩ ℔ 2.2c
Rods—⅝ and 11-16 round and square ... ₩ ℔ 2.1c
Bands—1 to 6x3-16 to No. 12 ... ₩ ℔ 2.4c
Swedish Iron:
Ordinary sizes ... [illegible]

Sheet Iron.

	Common American.	R. G. American.
Nos. 10 to 20	₩ ℔ 2¾c	3¾
21 to 24	₩ ℔ 3c	3¾
25 to 26	₩ ℔ 3¼c	4
27	₩ ℔ 3½c	4¼
28	₩ ℔ 3¾c	4¾c.

Galvanized, 14 to 20, B. B. ₩ ℔ 6½c; 2d qual. ₩ ℔ 5¾c
" 21 to 24, " ₩ ℔ 7¼c; " ₩ ℔ 6 c
" 25 to 26, " ₩ ℔ 7¾c; " ₩ ℔ 6½c
" 27 " ₩ ℔ 8¼c; " ₩ ℔ 7 c
" 28 " ₩ ℔ 9 c; " ₩ ℔ 7½c
Patent Planished ... ₩ ℔ A. 10½c; B, 9½c
Russia ... ₩ ℔ Nos. 8 to 14, 12c
American Cold Rolled ... ₩ ℔ 4½c

COPPER.—Duty: Pig, Bar and Ingot, 5c; Old Copper, 4c ₩ ℔; Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.
American Ingot ... ₩ ℔ See Trade Report.

SHEATHING, BRAZIERS' COPPER, BOLTS, &c.
Braziers' Copper, ordinary sizes, over 16 oz., ₩ sq. ft ... ₩ ℔ 26c
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., ₩ sq. ft ... ₩ ℔ 27c
Braziers Copper 10 oz and 12 oz., ₩ sq. ft ... ₩ ℔ 29c
" Lighter than 10 oz. ₩ sq. ft ... ₩ ℔ 31c
Circles less than 84 in. in diameter ... ₩ ℔ 28c
Circles 84 in. diameter and over ... ₩ ℔ 31c
Segment and Pattern Sheets ... ₩ ℔ 27c
Locomotive Fire Box Sheets ... ₩ ℔ 20c
Sheathing Copper, over 12 oz. ₩ sq. ft ... ₩ ℔ 25c
Bolt Copper ... ₩ ℔ 26c
Copper Bottoms ... ₩ ℔ 26c
No Copper is Sheathing except 14x48 inches and not to exceed 34 oz. to the sq. ft.

TINNING.
14x48, by the case ... ₩ sheet 6c
14x48, less than case ... ₩ sheet 8c
For tinning both sides, double the above amount.
O'NEILL'S PATENT PLANISHED COPPER.—Dis 7½ @ 10 %
14x48.
14 and 16 oz. and heavier .. ₩ ℔ 34c By the case. ₩ ℔ 33c
12 oz. and lighter ... ₩ ℔ 37c " " ₩ ℔ 36c
Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x60.
14 and 16 oz. and heavier. ₩ ℔ 36c By the case. ₩ ℔ 35c
(And all sizes not over 20 in. wide.)
30x60.
14 and 16 oz. and heavier ... ₩ ℔ 38c
12 oz ... ₩ ℔ 41c

Brass.
Brown & Sharp's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.
BRASS MANUFACTURERS' PRICE LIST.—dis nominal. July 1, 1878.
Cash prices for Roll and Sheet Brass. For less quantity than 100 ℔s. add 3c ₩ ℔.

HIGH BRASS.
All Nos. not thinner than to No. 28, wider than 2 in., not wider than 14 in ... 25c
All Nos. to No. 28, inclusive, and widths over 14 to 20 in., inclusive ... 30c
All Nos. to No. 28, inclusive, and widths over 20 to 30 in., inclusive ... 33c
½c ₩ ℔ advance on each No. above Nos. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass, at ... 48c
Sheets 24x48, and all sheets cut to particular sizes and lengths under 30 in., in width wider than 2 in. 32c
Printers' Rules ... 40c
Sheets wider than 30 in. and under 40 in ... 42c
" 40 in. and over ... 45c
Circular Sheets, in diam. from 4 in. to 14, inclusive. 35c
" " over 14 " 20, " .. 40c
" " " 20 " 30, " .. 44c
" " " 30 " 40, " .. 50c
" " " 40 in ... 54c

LOW BRASS.
4c ₩ ℔ more than High Brass.
Gilding Metal, 8c ₩ ℔ more than High Brass.
Platers' or Gold Metal { In Bars ... 49c; Sawed ... 40c; Planed or Polished ... 49c }

FOR SLITTING.
Metal in width 2 in. to ⅛ in. to No. 28, inclusive, 1c. ₩ ℔ advance.
Metal, in width 2 in to 1 in., thinner than No. 28, 2c. ₩ ℔ advance.
Metal, in width 1 in. to ⅛ thinner than No. 28, 3c ₩ ℔ advance
Metal, in width ⅛ in. to ¼, inclusive, not thinner than No. 28, 2c. ₩ ℔ advance.
Metal, in width ⅛ in. to ¼ thinner than No. 28, 5c. ₩ ℔ advance.
Metal, ¼ in. in width and less, 10c. ₩ ℔ advance.
Any of the above widths cut to particular lengths, add 7c. ₩ ℔.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire.
4 per cent., 12 inch, to No. 26	$0.52	$0.70
6 " " "	.56	.76
10 " " "	.64	.88
15 " " "	.74	1.03
18 " " "	.80	1.12

German Silver Sheets over 12in. wide and weighing more than 10 ℔s., $2.00 ₩ ℔.
Advance 2c. for each additional inch in width above 12 in., and 2c. ₩ ℔ on each No. thinner than Nos. 26 to 36, inclusive
All German Silver thinner than No. 36 is Platers, at 50c ₩ ℔ additional.
German Silver Scrap one-half less than net price of 12 in. Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.

BRASS AND COPPER WIRE.

	High Brass.	Low Brass.	Gild'g and Copper.
No. 0 to 20	$0.28	0.32	$0.38

No. 21	.31	$.35	.41
No. 22	.32	.36	.42
No. 23	.33	.37	.43
No. 24	.34	.39	.45
No. 25	.36	.42	.48
No. 26	.40	.44	.50
No. 27	.43	.47	.53
No. 28	.47	.51	.58
No. 29	.50	.54	.61
No. 30	.53	.57	.67
No. 31	.57	.61	.73
No. 32	.61	.65	.79
No. 33	.65	.69	.88
No. 34	.69	.73	.98

Spring Wire 2c ₩ ℔ advance.
Flat, Square and Half Round Wire 5c ₩ ℔ advance on Round Wire.
Fancy Wire not less than 10c ₩ ℔ advance of Round Wire.
Brass Rods, No. 8 and larger not less than 2 feet lengths, 33c.
Wire straightened and cut, smaller than No. 8, and not less than 2 feet lengths, 38c.
Wire and Rods less than 2 feet lengths, special rates.
Twelve cents per ℔ extra for spooling on 1 ℔ spools.

MISCELLANEOUS.
Common Plain Brass Pail Ears ... $0.36
Brass Door Rail ... .38

SCRAP.—net.
High Brass Scrap ... 11c
Low " ... 13c
Gilding ... 15c
Turnings, Filings and Chips half the price of Scrap.
Terms—Net cash. Interest to be added after thirty days.

TUBING.—dis 10 % ₩ ℔
Plain to No. 20 inclusive, above ¼ in. to 3 in ... $0.38
" above 3 in ... .48
Nos. 21, 22, 23, two cents advance on List for each Number.
Nos. 24, 25, 26, four cents advance on List for each Number.
Above No. 26, special rates.
Plain, ¼ inch ... .65
" 3-16 " ... 1.05
" ⅛ " ... 1.55
All Mandrel Drawn Tubes, 5 cents advance on List Prices.
Fancy Tubing to No. 20 ... 45c
English, Scotch and Extra Patterns Fancy Tubing to No. 20 ... .50
Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on List.
Add to 2 cents ⅛ cent for each additional cutting under 2 feet.
All Mandrel Drawn Tubes under ⅜ in., 25 cents per pound advance.

ZINC TUBING.—net.
Plain ... .22
Fancy ... .28
Scotch and Extra Patterns ... .31

GERMAN SILVER TUBING.—dis 10 %
4 Per cent ... .75
6 " ... .85
9 " ... 1.00
12 " ... 1.15
15 " ... 1.20
16 " ... 1.35
18 " ... 1.45
20 " ... 1.55

STEEL.—Duty: Bars, Ingots, Sheets and Coils, valued at 7 cents ₩ ℔., or under, 2¼ cents; over, 7 cents, and not above 11, 3 cents ₩ ℔; over 11, 3½ cents ₩ ℔, and 10 % ad val. Railway Bars, 1¼ cents ₩ ℔. Railway Bars, in part Steel, 1 cent ₩ ℔. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.
Tool ... 15c
Spring ... 7c
Homogeneous ... 12½c
Boiler Plate ... 8c
Tire ... 5½c
Machinery (round and square) ... 9c
File ... 9c
Sheet ... 11 @ 16c
Saw Plate, mill and mulay ... 14 @ 16½c
" gang and X cut ... 13 @ 14c
" circular as to size ... 18 @ 30c

Chrome Steel.
Tool ... ₩ ℔ 14 @ 15c
Tool, extra fine ... ₩ ℔ 40 @ 75c
Spring ... ₩ ℔ 8 @ 9c
Machinery ... ₩ ℔ 8 @ 10c
Gun or Homogeneous ... ₩ ℔ 12 @ 16c

English Steel.—
" Best Cast ... ₩ ℔ 15½c
" Extra Cast ... ₩ ℔ 16½c
" Round Machinery, Cast ... ₩ ℔ 10c
" Swaged, Cast ... ₩ ℔ 18c
" Best Double Shear ... ₩ ℔ 15½c
" Blister, 1st quality ... ₩ ℔ 13c
German Steel, Best ... ₩ ℔ 11c
" 2d quality ... ₩ ℔ 10c
" 3d quality ... ₩ ℔ 9c
Sheet Cast Steel, 1st quality ... ₩ ℔ 15½c
" 2d quality ... ₩ ℔ 14½c
" 3d quality ... ₩ ℔ 12½c

ANTIMONY ... 13½ to 14c
LEAD.—Duty: Pig $2 ₩ 100 ℔s; old Lead, 1½c ℔ ₩; Pipe and Sheet, 2½c ₩ ℔.
American ... 5c
Bar ... 5¾c dis 10 %
Pipe ... 5½c. dis 10 %
Tin Lined Pipe ... 12c. dis 10 %
Sheet ... 6½c, dis 10 %
Shot ... Drop 6½c, Buck, 7½. dis 10 %

BABBITT METAL.
N. P. U ... ₩ ℔ 6 @ 7c
A 20c; B, 16c; C, 12c; D 10c ₩ ℔.

TIN.—Duty: Plates, Sheets, Tagger and Terne, 1.1c ₩ ℔; Electro-galvanized Plates, 2c ₩ ℔; Manufactures of, not enumerated, 35 per cent. ad. val. Bars, Block and Pigs free. Banca, subject to duty of 10 per cent.
Banca ... ₩ ℔ 19c
Straits ... ₩ ℔ 16
English ... ₩ ℔ 16

TIN PLATES.
I C 10x14, 12x12, 14x20 } Prime Charcoal ... $6.75 @ 7.00
I X 10x14, 12x12, 14x20 } Prime Charcoal ... 8.75 @ 9.00
D C 12½x17 " ... 6.25 @ 6.50
D X 12½x17 " ... 8.25 @ 8.50
For each additional X add ... 2.00

COKE TIN PLATE.

	Best.	2d quality.	Ordinary.
I C 10x14, I C 12x12, I C 14x20	$6.25	6.00	5.50 @ 5.75

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$6.25	5.75 @ 6.00	5.25 @ 5.50
I X 14x20	@ 8.25	....	....
I C 20x28	12.75 @ 13.00	12.00 @ 12.50	11.50 @ 11.75
I X 20x28	@ 10.00	....	....
I C 20x200	@ 19.00	.. .	....
I C 14x20 M. F. Brand			$7.75

SOLDER ... No. 1, 9½c @ 10½c. No. 2, 9c
SPELTER—Duty: in Pigs, Bars and Plates, $1 ₩ 100 ℔s.
American, cash ... 5¼ @ 5½c
Bergen Port from Lehigh Ore ... 9c
Lehigh, on spot ... 10c
ZINC.—Duty: Pig or Block, 1.50 ₩ 100 ℔s. Sheet, 2½c ₩ ℔.
Sheet. Cask ... 6½c
" Open ... 7c

Paper Stock, Old Metals, &c

(Dealer's Selling Price.)
Canvas linen ... 4 @
White cotton, new ... 5½ @
" " No 2 ... @ 2
White linen rags, No. 1 ... 4 @
" " No. 2 ... 2½ @
Seconds ... 1½ @ 1¾
Mixed woolens ... 2¼ @ 3⅞
Soft woolens ... 8½ @
Gunny bagging ... 3⅜ @
Jute Butts ... 3 @ 3¼
Kentucky bagging ... 5 @
Waste paper and scraps ... @ 1
Rope cuttings ... 1½ @ 3
Kentucky bale rope ... 4 @ 4½
Grass rope ... @ 3
Tarred shaking ... 2 @
White collar cuttings, all paper ... 7 @
" " " muslin lined ... 5 @
" " Envelope ... 7 @
Hard White Shavings, No. 1 ... 3½ @
Soft " " No. 1 ... 3 @
White Shavings, No. 2 ... 2¼ @
Mixed Shavings, part white ... 2¼ @
Imperfections, No. 2, best folded sheets ... 3¼ @
" No. 1. Heavy Stock ... 3½ @
Book Stock ... @
" " Heavy ... 2⅜ @
" " Light ... 1¾ @
Newspapers ... @ 2
Prints ... 1½ @ 1½
Pure Manilas ... 2⅜ @ 2⅞
Bogus Manilas and Hardwares ... 1 @
Commons ... ¼ @
Binders' Board Cuttings ... 1 @ 1¼
Straw Board Cuttings ... ¾ @
Woolen Tailor Clips ... 1⅛ @ 1¼
Satinet " ... 2 @ 2½

Old Metal.
Copper, heavy ... 15 @
Copper Bottoms ... @ 13
Yellow Metal ... 10 @
Brass, light ... 9 @
" heavy ... 11 @
Heavy Composition ... 13 @
Old Lead, solid ... @ 3⅞
Tea Lead ... @ 3¾
Zinc ... 3½ @ 3⅞
Pewter, No 1 ... 11 @
" No. 2 ... 9 @
Wrought Iron ... per ton $17.00
Machinery Iron ... per ton 17.00
Light Iron ... per ton 10.00
Stove Plate ... per ton 10.00
Grate Bars ... per ton 4.00

Paints, Oils, &c.

Paints.
Black Lamp, Coach Painters ... ₩ ℔ 20c
" " Ordinary ... 6c
" Ivory Drop, fair ... 12 @ 14c
" " best ... 29c
Black Paint, in oil ... kegs, 8c asst'd cans, 11c
Blue, Prussian, fair to best ... 40 @ 50c
" " " in oil ... 35 @ 60c
Blue Chinese dry ... 89c
" Ultramarine ... 18 @ 30c
Brown, Spanish ... 1½c
" Van Dyke ... 10@12c
Carmine, 40 ... combination price
Green, Chrome ... 15 @ 23c
" " in oil ... 14 @ 18 @ 25c
" Paris ... good, 25c; best, 30c
" " in oil ... " 30c; " 45c
Iron Paint, Bright Red ... ₩ ℔ 2½c
" Red ... ₩ ℔ 2c
" Brown ... ₩ ℔ 1¾c
" Purple ... ₩ ℔ 3c
" Ground in Oil, Bright Red ... ₩ ℔ 5½c
" " " Red ... ₩ ℔ 5c
" " " Brown ... ₩ ℔ 4½c
" " " Purple ... ₩ ℔ 6c
Mineral Paints ... 1¼ @ 4c
Orange Mineral ... 12c
Red Lead, American ... 6c
" " English ... 9½c gold
" Venetian (N. C.) dry ... $1.65 @ $1.70
" " in oil ... asst'd cans, 11c; kegs, 8c
" Indian dry ... 9 @ 12c
Rose Pink ... 10 @ 13c
Sienna, American, Raw ... 4c
" Burnt ... 4½c
" " in oil ... 10 @ 16 @ 20c
" Raw " ... 11 @ 15 @ 25c
Umber, Burnt ... 4 @ 8c
" " in oil ... 9 @ 12 @ 16c
" Raw ... 3½ @ 7½c
" " in oil ... 10 @ 16 @ 18c
Vermillion, Chinese ... 90c, gold
" English ... 60c, gold
" Trieste ... 1.10, gold
" American, Common ... 15c
White Lead, American, pure dry ... 7 to 8c
" " " in oil ... 7½c to 8c
White, Paris, English, prime ... in bbls. 2 @ 2¼c
Yellow Ochre, French ... $1.75
" " " in oil ... asst'd cans, 11c; kegs, 8c
" " Vermont ... in casks 1¼c
Yellow Chrome ... 17 @ 27c
" " in oil ... 14 @ 18 @ 25c
Zinc White, American No. 1, dry ... 7c
" " No. 1, in oil ... 9c
" French (Paris) ... 11c
" " in oil ... 9 @ 10c

Oils.
Linseed, Raw, in casks and bbls ... ₩ gal. 63c & 65c
" Boiled " " ... " 68c & 70c
Bleached Whale ... ₩ gal. 51c
" Sperm ... ₩ gal. 103c
" Elephant ... 62c
Signal ... 53c
Prime Lard ... 59c
No. 1 " ... 52c
West Virginia ... 18c @ 25c
Drilling ... 40c
Empire Cylinder ... 65c
Miners' Oil ... 33 to 40c
Fish Oil, pressed ... 32c
Neatsfoot ... 70c
Tallow ... 58c
Machinery ... 40c
Engine ... 50c

Sundries.
Asphaltum ... [illegible]
Benzine ... ₩ gal. 16c
Chalk ... [illegible]
" Block ... [illegible]
Dryer, Patent, Am'n ... asst'd cans, 10½c; keg, 9c
Frostings ... 50c
Glue, White ... 38 @ 44c
" Sheet ... 20c
Glaziers' Points, Zinc ... 8c
Gum, Copal ... 36c
" Damar ... 25c
" Shellac, English ... 30c
" " dark ... 25c
Litharge, English ... 9c gold
Mineral Wool ... ₩ ℔ 1¼ @ 1½c
Pumice Stone, selected Lumps ... 4 @ 6c
" powdered ... 2½c
Putty, in bladders ... 2½c
" in bulk ... 2c
Rotten Stone, soft, English ... 8c
Spirits Turpentine ... 32c
Whiting Spanish ... ¾c

Glass.
FRENCH WINDOW GLASS.
Prices current per box of 50 feet.

Single Thick.—discount 60&10 %

SIZES.	1st.	2d.	3d.	4th
8 x 8 to 10 x 15	$8.00	$6.75	$6.25	$5.75
11 x 14 to 16 x 24	8.75	8.00	7.50	7.00
18 x 22 to 20 x 30	11.25	10.50	9.75	8.75
15 x 36 to 24 x 30	12.75	11.50	10.00	
26 x 28 to 24 x 36	13.50	12.25	11.25	
26 x 36 to 26 x 44	14.75	13.75	11.75	
26 x 46 to 30 x 50	16.25	15.00	13.00	
30 x 52 to 30 x 54	17.25	16.00	13.50	
30 x 56 to 34 x 56	18.75	16.75	15.00	
34 x 58 to 34 x 60	19.50	18.00	16.00	
36 x 60 to 40 x 60	21.00	19.50	18.00	

Double Thick.—Discount 70 %

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$12.00	$11.00	$10.00	$9.25
11 x 14 to 16 x 24	14.75	13.75	12.75	11.75
18 x 22 to 20 x 30	19.00	17.75	16.00	
15 x 36 to 24 x 30	21.50	19.25	16.50	
26 x 28 to 24 x 36	23.00	20.75	18.25	
26 x 36 to 26 x 44	25.00	23.00	19.25	
26 x 46 to 30 x 50	27.00	25.00	21.25	
30 x 52 to 30 x 54	28.50	26.00	22.25	
30 x 56 to 34 x 56	30.00	27.75	24.75	
34 x 58 to 34 x 60	31.75	30.00	27.00	
36 x 60 to 40 x 60	35.50	32.50	30.25	

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An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket

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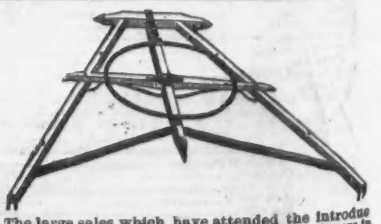

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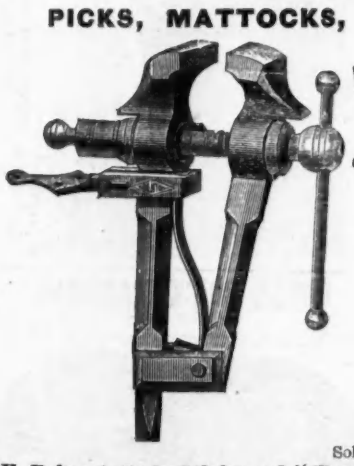

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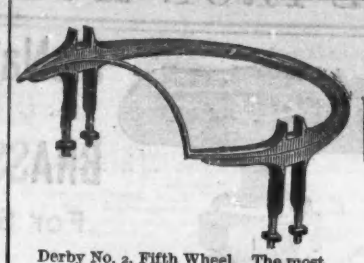

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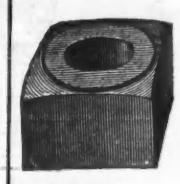

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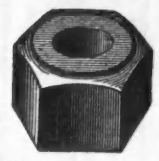

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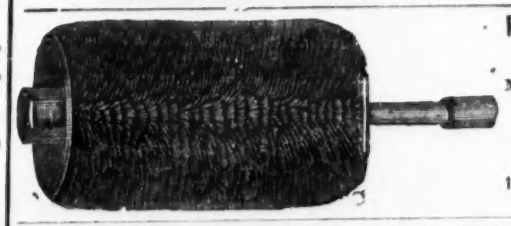

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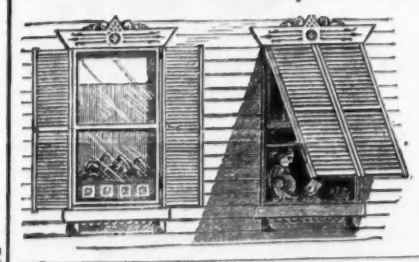

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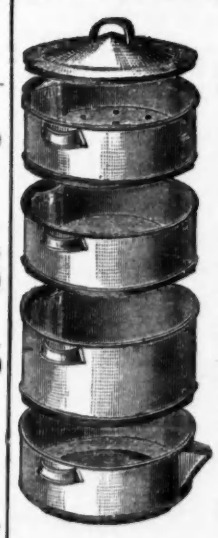

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The results of a long series of experiments made with a view of meeting all the requirements of a Perfect Packing. And we assert without reservation that it is the **best** article of its kind yet invented. It is made of the best materials, is elastic, pliable, and does not become hard by use, consequently is easily taken out when renewal is necessary. It has a rubber center, rectangular in form, covered with a series of braids of linen, between which is placed a lubricative compound superior to anything ever before used for the purpose, and contains nothing that can in any manner cut, flute or gum the rods, no matter how long run. It has thus far received the highest praise of every engineer who has used it, and we have received many testimonials from the proprietors of Mills, Factories, Iron Works, &c., that it is the most durable, efficient and cheapest packing they ever used. All we ask is a fair trial, knowing it will convince better than any words of ours. Orders promptly filled. **Wickersham & Co.,** Sole Agents, 152 N. Third St., Philadelphia.

JOHN STARR,

Hardware & Metal Broker,

AND

MANUFACTURERS' AGENT,

Halifax, Nova Scotia,

Representing in the Dominion of Canada so American Manufacturers, is ready to so further Agencies. Satisfactory references.

JESSOP'S
Patent Adjustable Pipe Tongs.

THE BEST IN THE MARKET.

Send for Samples.

EATON, COLE & BURNHAM COMPANY,

Sole Manufacturers,

58 John Street, New York.

McNab & Harlin Mfg. Co.,

MANUFACTURERS OF

BRASS COCKS and VALVES

For STEAM,

WATER

and GAS.

Iron Pipe and Fittings.

PLUMBERS' MATERIALS.

New Illustrated Catalogue and Price List sent by express to the Trade on application.

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The Perfect Comb.

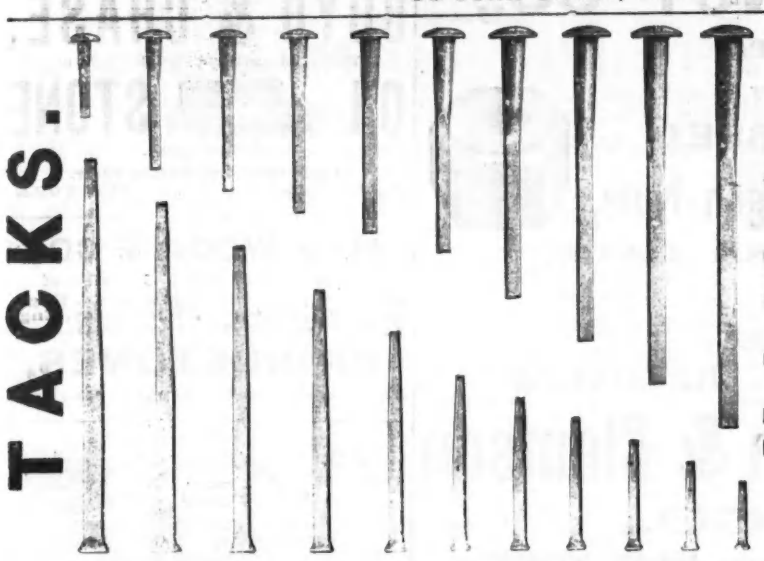
We call your attention specially to our new patent wireless wire frame comb. The result of a long series of experiments, made with a view to meeting all the requirements of a *Perfect Comb*. It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the horse while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when clasped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: **The Perfect Comb.**

THE LAWRENCE COMB CO.

Factory and Office,

382 2d Ave., cor. 22d St., N. Y.

TACKS. NAILS.



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Of Every Kind.

COPPER, ZINC, STEEL & SWEDES & COMMON IRON SHOE NAILS, &c.

Copper, Iron and Galvanized Boat Nails,

Regular or Chisel Pointed.

Brass & Iron Wire Nails, Moulding Nails and Escutcheon Pins, Chair & Cigar Box Nails, 2d & 3d Fine Nails, Roofing Tacks and Nails, &c., &c.

MADE BY THE

AMERICAN TACK CO., Fairhaven, Mass.

A full line of goods may be found at our

NEW YORK SALESROOM, No. 117 Chambers Street

HAND FREEZER. 2 to 25 qts. $3.50 to $25.00

HAND OR POWER. 25 and 40 qts. $75.00 and $175.00

HAND OR POWER ICE CRUSHER. $75.00.

SANDS' TRIPLE MOTION WHITE MOUNTAIN ICE CREAM FREEZERS.

Galvanized iron outside, tin inside. No *secretions of oxide of zinc* need be feared in the use of this Freezer. Simple in construction, perfect in results. Send for descriptive circular and discounts of this celebrated Freezer. Address

WHITE MOUNTAIN FREEZER CO., Laconia, N. H.

COULTER, FLAGLER & CO.,

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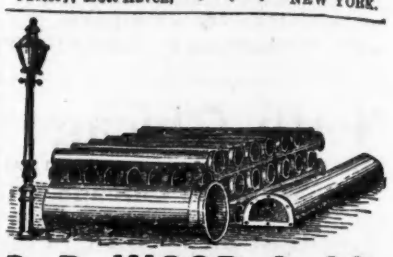
Hardware Manufacturers' Warehouse.

Office and Warehouse of Union Hardware Co.; Rugg Mfg. Co., Draw Knives, Chisels, &c.; Deuse Bros., Bits, Corkscrews, &c.; Richardson Bros., Saws of all kinds; Brooks Edge Tool Co.'s Axes, Hatchets, &c.; M. Price, Hatchets, &c.; J. & W. Rothery, Extra Hand Cut Files; L. D. Frost, Carriage Bolts, Refined and Norway Iron; Cowles Hardware Co., Screwdrivers, Mincing Knives, &c.; Rider, Wooster & Co., Anti-Friction Barn Door Hangers, &c.; H. B. Hawley, Shears of all kinds; Walden Knife Co., Pocket Cutlery; American Screws; N. Y. Anti-Friction Metal Co.'s Babbitt Metals; Howard, Razor Strops; C. Forschner, Spring Balances; P. Lowentraut & Co., Dividers, Calipers, &c.; Shepard Hardware Co., Fluters, Blind Hinges, &c.; Saxton & Amedon, Braces, all kinds; Bevin Bros. Mfg. Co., Bells, all kinds; B. H. Parsons & Bro., Pliers, Nippers, &c.; C. L. Griswold, Cast Steel Bits; Lancaster Lock Works, Jail Locks.



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Philadelphia,

Manufacturers of

Cast Iron Pipe

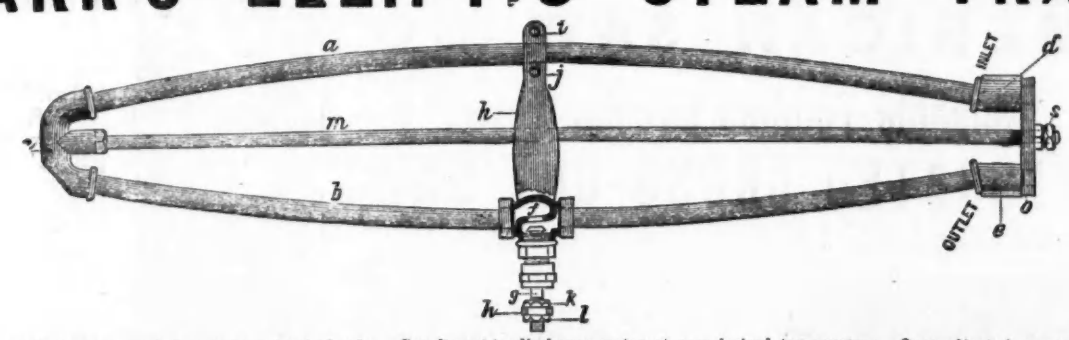
FOR WATER AND GAS.

Lamp Posts, Valves, &c.,

Mathew's Pat. Anti-Freezing Hydrants.

400 CHESTNUT STREET.

BARR'S ELLIPTIC STEAM TRAP.



Has no floats or concealed parts to get out of order. Can be set to discharge water at any desired temperature. Once adjusted, never needs the slightest attention, being ABSOLUTELY AUTOMATIC in action. Never FREEZES in exposed situations, such as Rolling Mills, Hammer Shops, &c. Simplest in construction of any trap made. Has no reservoir in which to accumulate condensation, but discharges incessantly. Can be set in any position, either side or end up, without altering its working. Occupies less space, and being so light, can be used in situations where no other can.

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PANCOAST & MAULE, 243 and 245 South Third St., Philadelphia, Pa.

Self-Measuring Oil Tank!

Patented Oct. 23d, 1877.

Economy, Convenience and Cleanliness Combined.

All five-barrel tanks have five-gallon measure, without extra charge.

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A. M. GILBERT & CO., 95 Lake Street, Chicago.
" " 157 Water Street, Cleveland.
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CARR'S PATENT Water Closets,

PUMPS, CABINET WOOD WORK, &c.

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THE SUGAR MAKERS' FRIEND

Over 2,500,000 in Use.

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More Sugar and better quality from EUREKA SAP SPOUTS than from ANY others! is the verdict of all users. Call for them at your Hardware Stores. *Responsible Agents wanted.* Samples, circulars and terms sent, postpaid, on receipt of 20 cents. Address C. C. POST, Patentee, Burlington, Vt.

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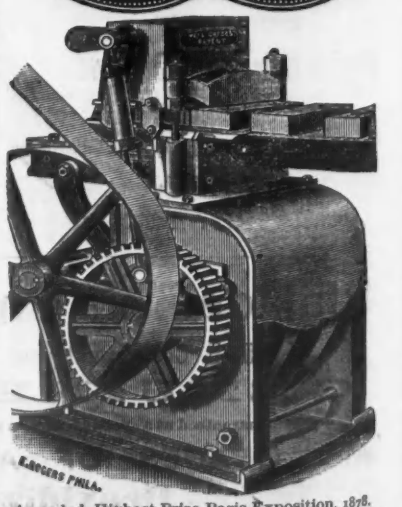
AMONG THE

"Masterpieces Centennial Exposition, 1876."



Awarded Highest Prize Paris Exposition, 1878. The above is a cut of Gregg's No. 2 Brick Machine, simple, strong and efficient, for making and re-pressing bricks. Gregg's Triple Pressure Brick Machines. Gregg's Combination Brick Machines. Gregg's Steam Power Re-pressing Machines. Gregg's Hand Power Presses. Agents wanted in every city and town. Send for catalogue.

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CLARK'S PATENT EXPANSIVE BITS

Made of JESSOP'S BEST CAST STEEL, and warranted superior to any other

Two sizes: Large Size Boring, ⅞ to 3 inches; Small Size Boring, ½ to 1¼ inches.

Manufactured by

WILLIAM A. CLARK, - - - Westville, Conn.

ANVIL & VISE COMBINED.

No. 1, 10½x4 in. face, 4 in. jaw Vise, weight 40 lbs., $4.50
No. 2, 8x3¼ in. face, 3½ in. " 25 " 3.75
No. 3, 6x2¾ in. " 2¾ in. " 14 " 3.00

The face of the Anvil is chill hardened. Terms cash. Delivered on cars at Worcester.

RICHARDSON MF'G. CO., Worcester, Mass.

Liberal discount to the trade.

HOLROYD & CO.,

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Johnson Street,

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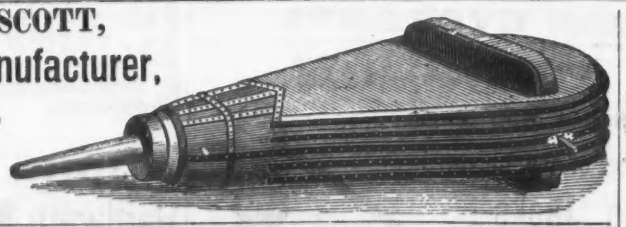
CHICAGO, ILL.



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The undersigned, begs to inform his friends that he continues to make translations of Catalogues, Prices-current, Circulars, Correspondence, &c., from and into the

ENGLISH,

FRENCH,

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and SPANISH,

and that he bestows special attention upon a strictly correct rendering of **Technical Expressions** in matters relating to **Machinery, Metallurgy, Hydraulics,** &c. The very best reference will be furnished from leading manufacturers in this city, Philadelphia and elsewhere, for whom he has translated. If desired, estimates will be procured for the setting up, electrotyping and printing of catalogues, &c., in the above languages.

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Metal Reporter of The Iron Age,

83 Reade St., New York.

COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass and Iron Rivets; Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk Clout and Cigar Box Nails, &c. Rivets made to Order.

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Agents for the Philadelphia Star Carriage and Tire Bolts.

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Manufacturers of every description of

PLATE & SHEET IRON

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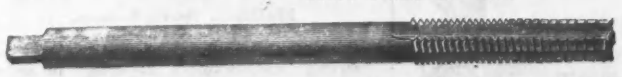
Sole Manufacturers of

Goddard's Patent-Relieved Machinists', Blacksmiths' and Gasfitters' Taps. Solid Reamers, Screw Plates and Dies.



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Dealers in Machinists' Supplies. **14 DEY STREET, New York.**

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(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Anvils.
Peter Wright's, ℔ ℔, gold...10½c
over 200 lbs...11c net
Wilkinson's, ℔ ℔, gold...11c. net
Eagle (American)...9 cents per lb—dis 20%

Apple Parers.—
Reading No. 72...per doz $ 5 00 net
" " 74... " 6 00 net
" " 76... " 7 00 net
" " 78... " 7 50 net
... " 10 00 net
Peach Parers... " 7 50 net
Little Favorite, corer and slicer... "
Lots of 10 to 25 dozen special price.

Axes.—
Mann's Red Warrior ...Per doz. $8 00 @ 8 50 net
Red Indian... " 8 00 @ 8 50 net
Red Chieftain, bevelled... " 8 50 @ 9 00 net
Crown Prince... " 8 50 @ 9 50 net

Augers and Auger Bits.—
Bates' Nut Augers...dis 50 @ 55 %
Cook's Augers...dis 50 @ 50&5 %
Watrous' Ship Augers...dis 15 %
Benjamin Pierce Auger Bitts...dis 40 %
Griswold Auger Bits...dis 50 @ 55 %
Cook's " " ...dis 50 @ 50&5 %
Jennings' " " ...dis 10&10 %
Bonney's Pat. Hol. Augers, list $48 ℔ doz...dis 25&10 %
Stearns' Pat. Hol. Augers " $48 " ...dis 25&10 %

Balances.—
Light and "Common"...dis 25&10 %

Bells.—
Bevin Bros. Mfg Co. Light Hand Bells...dis 70 @ 75 %
Swiss Pattern Hand Bells...dis 50 @ 50&10 %
Connell's Door Bells...dis 50 @ 50&10 %
Gt. Western & Kentucky Cow, new list...dis 50&10 %

Bolt and Rivet Clippers.
Chambers' No 1, for ⅜ boltt, each ...$ 7·50 } dis. 25 %
" " 2, " ½ " ... 9·00
" " 3, " ⅝ " ... 12·00

Boring Machines.—
Upright, with Augers...List $9 00 dis 40&10 %
" without Augers... " 5 50 dis 40&10 %
Angular, with Augers... " 11 00 dis 40&10 %
" without Augers... " 7 00 dis 40&10 %

Bolts.—Eastern Carriage Bolts...dis 75&8 %—cash
Philadelphia " " ...dis 70 %
Stanley, Wrought Shutter...dis 50 %

Braces.—Barber's...dis 40&5 %
Backus...dis 50 @ 50&10 %
Spofford...dis 50&5 %
American Ball...dis 35 %

Butts.—Cast Fast Joint, Narrow...dis 60&10 %
" " Broad...dis 65&10 %
Cast Loose Joint, Narrow...dis 70&10 %
" " " Broad... 70&10 %
" Acorn, Loose Pin...dis 70&10 %
" Acorn " Jap'd...dis 75&10 %
Mayer's Loose Joint...dis 70&10 %
Wrought Loose Pin...dis 50 %
" Table Hinges and Back Flaps...dis 45 %
" Narrow, Fast...dis 50 %
" Loose Joint...dis 50 %

Blind Butts.
Parker...dis 75&10 %
Clark...dis 75&10 %
Shepard...dis 70&10 %
Lull & Porter...dis 66⅔&10 %
Buffer's...dis 33⅓ @ 33⅓&10 %

Chains.—German Halter and Coil...dis 40 @ 40&10 %
Galvanized Pump...℔ ℔ 10c net
Best Proof Coil Chain—(English).

℔ ℔	11¼	8⅛	7¾	7½	8⅛	8¼	7c gold
	3-16	¼	5-16	⅜	7-16	½	⅝ in.

Chisels.—Socket Framing...dis 65, 5&10 %
Socket Firmer...dis 65, 5&10 %
Butcher's...$5 00 to £ gold

Casters.—Bed...dis 50&10 %
Plate...dis 50&10 %

Coffee Mills.—Box and Side...dis 25 %
Enterprise...dis 20 %

Cutlery.—Wallen Pocket...dis 35&5 % cash
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net

Drawing Knives.—
Hart Mfg Co.'s...dis 65, 5&10 %
Adjustable Handle...dis 20 %

Fry Pans.
Tinned...dis 50&10 @ 60 %

℔ doz.	$3·50	4 00	4·50	5·00	5·50	6·50	7·50	9·00	10·00
No.	0	1	2	3	4	5	6	7	8

Burnished...dis 60&5 %

℔ doz.	$3·00	3·75	4·25	4·75	5·25	6·00	7·00	8·00	9·00
No.	0	1	2	3	4	5	6	7	8

Files.
Nicholson...dis 35 %
Disston...dis 35
Butcher...$1 50 £ gold
Spencer...$4 50 @ 4 75 £ gold

Fluting Machines.
Eagle—3½ in. roll...Each $1 62½ net
" —5½ in. roll... " 2 12½ net
Crown—1½ in. roll... " 2 62½ net
" —6 in. roll... " 3 00 net
" —8 in. roll... " 5 00 net
Geneva Fluter...dis 20 %
Favorite com. Fluter & Sad-Iron...℔ doz $20 dis 25&10

Hammers.
Yerkes & Plumb's...dis 20 %

Hatchets.
Yerkes & Plumb...dis 33⅓ %
Hunt...dis 25 %

Hinges.
Strap and T...dis 60&10 %

Horse Nails.

	Nos. 5	6	7	8	9	10
Ausable	30	27	25	24	23	22
" Polished & P't'd and Blued and Pointed	31	28	26	25	24	23
Globe...Net list	26	23	21	20	19	18
Clinton	22	20	19	18	17	
" Polished and Pointed	23	21	20	19	18	

Southern, all sizes...℔ ℔ 14c. net
Discount on Ausable and Clinton, 20 %; Globe, net.

Locks and Knobs.
Branford...new list, dis 60&10&2 % cash
Gaylord Cabinet...dis 25&2 % cash
United States Lock Co...dis 35 %
American Padlocks...dis 33⅓, 5&2 % cash
Scandinavian Pad Locks...dis 50&10 %

℔ doz.	$5·00	5·50	6·50	7·50	8·50	10·00	12·50	dis 50 %
No.	57	58	59	60	61	62	63	
℔ doz.			$18·00		26·00		33·00	dis 50 %
No.			64		65		66	

Lanterns.—
Square Candle and Oil...℔ doz. $2 75 @ 3 00
Tubular...No. 0, $10·50; No. 1, 12·50 ℔ doz. net
Guards, 50 cents extra per doz. net.

Mattocks.—
Long and Short Cutter...℔ doz. $9 00 @ 9 50 net
Pennsylvania Pattern... " 9 50 @ 10 00 net

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets...dis 20 %
Stebbins' Gates...dis 62½&10 %
Lincoln's " ...dis 62½&10 %
Landers, Frary & Clark's Petroleum...dis 40&10 %
Brass Liquor Cocks...dis 5 %
Cork Lined " ...dis 65 @ 65&10 %

Meat Cutters.—Dixon's...dis 25 @ 30 %
Woodruff...dis 25 @ 30 %
Stowe...dis 25 @ 30 %
Hale's...new list, dis 50&2 %
American...dis 25 %
Stuffers...dis 25 @ 30 %
Enterprise Stuffers...dis 20 %

Planes—Sandusky...dis 50 %
Ogontz...dis 60 %
Bailey...dis 25&10 %

Plane Irons.—Sandusky...dis 10&10 %
Butcher's...gold £, $5 50

Plumbs and Levels.
Stanley's Adjustable...dis 65&10 %
" Non-Adjustable...dis 65&10 %

Picks.—Philadelphia...dis 0 %
Hunt's...dis 25 %

Pumps.—Bickford...$7.00, dis 20&10 %

Rules—Stanley Boxwood...dis 70&10 %
Stanley Ivory...dis 60&10 %

Steelyards.—Hart's Pattern...dis 60&10 %

℔ doz.	$14·50	17 75	21·00	26·50	31·00	35·50
Lbs	50	100	150	200	250	300

American Pattern...dis 25 @ 25&10 %

℔ doz.	$5·50	7·00	9·00	10·00	11·00	12·00
Lbs	50	100	150	200	25	300

English Pattern...dis 20 @ 25 %

℔ doz.	$7·00	8·67	10·67	12·67	14·67	16·67
Lbs.	50	100	150	200	250	300

Squares.—
Steel and Iron...dis 50 %; full case, dis 50&10 %
Try Squares, Stanley...dis 50&10 %
Disston's Try Squares...dis 50&10 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened...℔ doz. $8.00 net
Clipper No. 10, Bronzed Blade Boxed and Sharpened...℔ doz. $7·50 net
Clipper No. 5, Painted Red, Boxed and Sharpened...℔ doz $7·25 net

Saws—Disston's Hand, Panel and Rip...dis 20 %
Disston's Circular...dis 30 %
" Cross-Cut No. 2 Ti-in Tooth...℔ ft., 45c net
" " Patent Tooth...℔ ft., 45c. net
" " Champion Tooth...℔ ft., 35c. net

Shovels and Spades.
Rowland...dis 50&5 %
Oliver Ames & Sons, new list...dis 20 %
Not stamped "Ames"...dis 37½ %

Sad Irons.—4 to 10 lbs...℔ ℔, 2¼ @ 2½c
Mrs. Potts' Patent...dis 30 @ 40 %

Stone.—Arkansas Oil Stone...℔ ℔ $2·00 net
Washita Extra... " 36 } dis 10 %
" No. 1... " 20
" 2... " 14⅓
" Slips... " 45
" Axe... " 2
Turkey Oil Stone No. 1... " 18½c net
" " " 2... " 16c net
" Axe Stone... " 25c net
Hindostan Oil Stone No. 1...℔ ℔ 4 @ 4½c net
" Axe Stone... " 5 @ 5½c net

Screws.
Flat Head Iron...dis 60 %
" " Brass...dis 47 %
Round Head Brass...dis 45 %
" " Iron...dis 50 %

Spoons.—
Plated...dis 40 @ 40&5 %
German Silver...dis 30&10 %
Britannia, Boardmans...dis 65 %
" Parkers...dis 65 %
Tinned...dis 15 @ 20 %
" by case...dis 20 %

Springs—Torrey...℔ doz $2·00 @ 2·10 net
Philadelphia...5 in., $5·00; 8 in., $7·00 ℔ doz. dis 25 %
Chatfield...No. 1, $3·50; 2, $4·00; 3, $6 00 ℔ doz. net
Gem Coil No. 1, Large Jap'd...℔ doz $3·50 } dis
" " No. 2, Medium Jap'd... " 2·50
" " No. 3, Small " ... " 2·00

Stocks and Dies....dis 10&5 %

Stove Polish.—Gem...℔ gross, $4·50, dis 5 %
Dixon... " $6·00, dis 5 %
Onyx... " $4·00 @ 4·25 net

Tacks, Brads, &c.—New List...dis 55&10 %
Shoe Nails—
4-8 and larger, 9c; 3½-8, 9½c ℔ ℔ New list, net
Double Pointed Tacks...dis 40&5 %

Traps.
Genuine Oneida—Newhouse...dis 33⅓ %
Im. Oneida—Newhouse list (1st qual.)...dis 60&10 %

Vises.—Solid Box, Trenton new list...dis 35 %

Wrenches.—
Girard (Coe's Pattern)...dis 50 @ 10&10 %
Agricultural—
℔ doz 10 in., $3 60; 12 in., $5 40 net; case dis 5 %
Coes' Genuine...dis 60&10 %
" Pat. Wrot Bar...dis 60&10 %
" " Mall " ...dis 75&10 %
Taft's " Wrot " ...dis 75 @ 75&10 %
Phila. Tool Co., Duplex...dis 25 %

Wire.—
Bright or Ann'd, No. 19 to 26...dis 62½ %
" " No. 27 to 36...dis 67½ %
" " No. 0 to 18...dis 62½ %
Coppered 0 to 18...dis 55%
Tinned Broom Wire...dis 55%
Galvanized, No. 7 to 18...Market list, dis 80 %

Wringers.—Novelty No. 10...℔ doz. $60 00 net
Novelty No. 2... " 68·00 net
Universal, No. 2½... " 60·00 net
" No. 2... " 68·00 net

PITTSBURGH.

Merchant Iron.

Flat Bar.
1⅛ to 4x⅜ to 1 in...1.80c | 1¼ and 1⅜x⅜ to ¾ in...1.90c
4¼ to 6x⅜ to 1 in...1.90c | 1 and 1⅛x⅜ to ¾ in... 2c
1⅜ to 6x1⅛ to 1½ in...2.20c | ⅝, ¾ and ⅞x⅜ to ⅝ in...2.20c

Rounds and Squares.
1 to 1⅞ in...1.80c | ⅝ to 9-16 in... 2c
2 to 2⅝ in... 2c | ½ to 7-16 in...2.20c
2¾ to 3¼ in...2.30c | ⅜ in...2.40c
3⅜ to 4 in...2.80c | 5-16 in...2.60c
¾ to ⅞ in...1.90c | ¼ in...2.80c
| 3-16 in...4.80c

Horse Shoe Bar—all sizes...2.80c

Heavy Bands.
3½ to 6x¼ and 5-16 in. 2c | 1 to 1⅜x¼ and 5-16...2.10c
1⅛ to 3¼x¼ & 5-16 in. 2c | ¾ to ⅞x¼ and 5-16...2.30c
| ⅝ & ½x¼ and 5-16...2.80c

Light Bands.
3 to 6x⅛ to 3-16 in...2.10c | 1 to 1⅜x⅛ to 3-16...2.50c
1⅛ to 2¾x⅛ to 3-16 in...2.30c | ¾ and ⅞x⅛ to 3-16 in...2.80c
| ⅝ and ½x⅛ to 3-16 in...3.30c
Same sizes X No. 11 and No. 12 2-10c. extra.

Hoop Iron.
⅝ & 9-16, Nos. 13 to 16...4.50c | ⅝ & 9-16, Nos. 17 to 20...4.80c
¾&11-16, Nos. 13 to 16... 4c | ¾ & 11-16, Nos. 17 to 20...4.30c
⅞&13-16, Nos. 13 to 16...3.50c | ⅞ & 13-16, Nos. 17 to 20...3.80c
1 & 1⅛, Nos. 13 to 15...3.10c | 1 and 1⅛, Nos. 16 to 19...3.40c
1¼ to 2, Nos. 13 to 15...2.70c | 1¼ to 2, Nos. 16 to 18...2.90c
| 2¼ to 3½, Nos. 13 to 15...2.80c
The prices under Hoop Iron do not apply to Cotton Ties.
1-10c ℔ ℔ extra for each gauge lighter.

Oval Iron.
⅞ to 1¼ in...2.20c | ½ in...2.8c
⅝ to ¾ in...2.40c | ⅜ in... 3c

Half Oval & Half Round
⅞ to 1¼ in...2.50c | ½ in...3.30c
⅝ to ¾ in... 3c | ⅜ in...4.80c
| W'g'n Box Iron, ¾&⅞...3.30c

Sheet Iron.

	Com'n.	Charc'l		Com'n.	Charc'l
No. 10 to 14	2.60c	4.10c	No. 22 to 24	3.30c	4.80c
No. 15 to 17	2.80c	4.30c	No. 25 & 26	3.50c	5c
No. 18 to 21	3.10c	4.60c	No. 27	3.70c	5.20c
			No. 28	4.10c	5.60c

All Sheets, No. 18 and lighter, over 30 in. wide, not less than 2-10c. extra.

Wood's Patent Planished Sheet.
1st quality (A)...10½c | 2d quality (B)...9½c
Plate Iron—3-16 to ½ in. thick...2.8c

Galvanized Iron-Juniata.
Nos. 14 to 20...12c | No. 27...15c
Nos. 21 to 24...13c | No. 28...16c
Nos. 25 and 26...14c | No. 29...18c
Common and imperfect Juniata, 45 to 50 % off. Discount, 30 to 40 %.

Roofing Iron, Corrugated or Crimped.
Galvanized Common. | Black.
No. 20...6c, net cash | No. 20...3½c
No. 21 & 22...6¾ " | Nos. 21 & 22...4c

Bridge Iron.

Carnegie Bros. & Co.'s list.

Beams and Channels.
Solid Wrought Iron Beams, 3 to 10½ in.x30 ft...℔ ℔ 2¾c
" " " " 12 in. by 25 ft... " 2¾c
" " " " 15 in. by 25 ft... " 2¾c
Deck Beams, 7 to 9 in. by 30 ft... " 2¾c
Channel Bars, 1¼ to 10 in. by 30 ft... " 2¾c
" " 12 in by 30 ft... " 2¾c

Tee Iron.
1 in.x1 in. to 5 in.x3 in...℔ ℔ 2.8c

Angle Iron.
Equal Sided, 1x1 to 1¾x1¾ in...℔ ℔ 2.6c
" " 2x2 to 4x4... " 2.5c
Unequal Sided, 2x1¾ to 5x4... " 2.5c
Square Root Angles, 2x2 to 3½x3½... " 2.5c
Star Iron, 1½x1½ to 4x4... " 2.6c
Sash Iron, 1¾x⅞x3-16... " 3.25c
Miscellaneous Shapes, various shapes...℔ ℔, 2.6 to 3.5c
Special prices for large lots.

Nails.

Fence and Brads.
10d to 60d...$2.15 | 4d and 5d...$2.90
8d and 9d... 2.40 | 3d... 3.65
6d and 7d... 2.65 | 2d... 4.90

Barrel.
¾ in... 6.15 | 1⅛ in... 3.90
⅞ " ... 5.15 | 1¼ " ... 3.65
1 " ... 4.65 | 1⅜ " ... 3.15
| 1½ " ... 2.90

Lining.
⅝ in... 6.65 | ¾ in... 8.15
Tobacco...50 cents per keg advance on common
Clinch—All sizes... 3.90

Slating.
5d... 3.15 | 3d... 3.90
4d... 3.15 | 2d... 5.15

Finishing.
| 1½ to 1¾ in... 4.15
1 in... 7.15 | 2 in... 3.90
1¼ " ... 6.15 | 2½ " ... 3.65
1⅜ " ... 4.40 | 3 " and over... 3.40

Casing and Box.
| 6d... 3.40
10d to 30d... 2.90 | 4d... 3.65
8d... 3.15 | 3d... 4.65

Fine Blued.
| 3d... 5.15
4d... 3.90 | 2d... 5.90
Cut Spikes—All sizes... 2.40
Boat Spikes—All sizes... 2.90
Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days; or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice. An abatement of 10 cents per keg allowed upon orders of 200 kegs or over.

Steel.

Square, Flat and Octagon Tool Steel.
⅜ to 2 in...13c | 7-32 and 4⅛ 5 in...16c
5-16 and 2⅛ to 3 in...14c | 3-16 and 5⅛ to 6 in...19c
¼ and 3⅛ to 4 in...15c | 5-32 in...24c
Single and Double Shear Nailers—Same as Tool.
Knife, Tap, Die, Mill Pick, Drill—Ordinary sizes...13c

Machinery Steel—Round.
⅜ to 2 in...7½c | 7-32 and 4⅛ to 5 in...10½c
5-16 and 2⅛ to 3 in...8½c | 3-16 and 5⅛ to 6 in...13½c
¼ and 3⅛ to 4 in...9½c | 5-32 in...18½c
Cast Spring Steel. | 1⅝ to 3x5-32 to 3-16 in...7½c
1 to 4x¼ to ½ in...6½c | ⅞ to 1⅝x5-32 to 3-16 in...8½c

Agricultural Steels.
Solid Cast Steel Plow, 4 to 16 by 3-16 to ⅜ in... 7c
"Iron Center Plow," 4 to 16x3-16 to ⅜ in... 8c
"Iron Back Plow," 4 to 16x3-16 to ⅜ in... 8½c
Soft Steel Center Plow, 4 to 16x3-16 to ⅜ in... 9c
Landside and Cultivator, C. S., ½ in. thick... 9½c
Circular Plow Coulters, 5-32 to ¼ in. thick...11c
Reaper and Scythe...13c
Fork and Hoe... 7c
Horse Rake Teeth, to length... 8c
Finger Bar... 8½c
Cutter Bars, C. S... 8½c
" " German Spring Steel... 7½c
Cornstalk Cutter beveled to length... 8c
Planters' Hoe, C. S... 9c
Hoe, C. S... 7½c

Sheet Steels.
German, 10 to 16 g... 8c | Common C'st, 17 to 20 g...10c
" 17 to 20 g...11c | Best Cast, 10 to 16 g...13c
Common C'st, 10 to 16 g. 9c | " " 17 to 20 g...14c

Rolls and Castings.
Furnace, Floor and Straightening Plates...1¾ @ 2c
Housings and Castings not otherwise specified...2½c
Guide Plates...3 c
Spindles and coupling boxes...2 @ 2¼c
Sand Rolls and Pinions, large size...2½c
" " small size...3 c
Pipe Mill Castings...4 c
Rolling Mill Castings under 50 lbs...3 c
Spur and Bevel Wheels, large...3 @ 3¼c
" " small...4 @ 4¼c
Pulleys up to 30 inches...4 c
" over 30 inches...3¼ @ 3½c
Engine Castings, light...3¾c
" " heavy...3¼c

Chilled Rolls.
6 to 7 in. diam., 7 to 20 in. long...6 c
8 to 15 in. " 8 to 40 in. " ...5 c
15 to 24 in. " 15 to 72 in. " ...4 c
24 to 31 in. " 72 to 108 in. " ...4½c

Heavy Hardware.

Bolts, Screws, Nuts, etc.
Lewis, Oliver & Phillips, discount off Standard List.
Carriage & Tire Bolts, ordinary orders 75, & 5 % off net
Stove Bolts...40&5 % off net
Elevator Bolts...30 % off net
Machine and Square Head Bolts...60&10 % off net
Coach and Lag Screws...60&10 % off net
Bolt Ends...60&10 % off net
Pat. Hot Pressed Sq. and Hex. Nuts...8c ℔ ℔ off net
Washers, all made from new band iron...8c ℔ ℔ off net
Nuts and Washers in 25 ℔ boxes, ½c ℔ ℔ ex. Nuts and Washers in lots less than one keg each size, ½c ℔ ℔ ex. Nuts and Washers in 5 ℔ boxes, 1c ℔ ℔ ex
Strap and T Hinges...60&10 % off net
Harrow Teeth...net
Skein Bolts...net
Cast Iron Washers...3½c ℔ ℔ net
Fire Shovels and Pokers...50 % off

Wagon Hardware.
Single Trees, Neck Yokes and Double Trees, made from best selected hickory, and ironed complete, in the most approved patterns.
No. 1 Southern Plow Single Tree, Ironed complete, Irons all Wrought...each, 25c net
No. 2 Western Plow Single Tree, Ironed complete, Irons all Wrought...each, 35c net
No. 3 Wagon Single Tree, Iron complete, Irons all Wrought, except Malleable Ferrule...each, 50c net
No. 4 Wagon Single Tree, Ironed complete, Irons all Wrought; Improved End Pieces riveted on; one side acts as a wear iron for wheel to rub against...each, 50c net
Neck Yoke, Ironed complete, Irons all Wrought except End Ferrules, with Wt. Iron Rings...each, 60c net
Southern Plow Double Tree, Ironed complete, Irons all Wrought...each, 50c net
Wagon Box Strap Bolts—
For orders of 100 Set, 45&10 % dis.
10 in. long by 7-16 at Screw End, ℔ set of 8 bolts.. 45c
12 in. " ½ " " 8 " .. 55c
10 in. " 9-16 " " 8 " .. 65c
12 in. " 9-16 " " 8 " .. 70c
14 in. " 9-16 " " 8 " .. 80c
10 in. " ⅝ " " 8 " .. 80c
12 in. " ⅝ " " 8 " .. 80c
14 in. " ⅝ " " 8 " .. 90c
16 in. " ⅝ " " 8 " .. 1.00
18 in. " ⅝ " " 8 " .. 1.10
20 in. " ⅝ " " 8 " .. 1.20
5c ℔ set for each additional inch over 14 inches. All lengths made.

Horse Shoes, Etc.—In 100 keg lots.
Juniata Horse Shoes...per keg, $3.50
" Mule " ... " 4.50
" "Roadster" pattern... " 3.75
Steel Toe Calks...per 7½c lb.
Thistlewood & Co.'s Self-Sharpening Horse Shoes...per keg, $5.25
Thistlewood & Co.'s Self-Sharpening Snow Shoes... " 5.50
Toe Calks...per lb. 8c

White and Red Lead.
White Lead in Oil, Assorted Kegs (all sizes)...7½c
" " 25 ℔ Tin Pails, 100 ℔ Cases...8 c
" " 12½ ℔ Tin " " ...8½c
Red Lead...in kegs, 6¼c; in barrels, 6 c
Orange Mineral... " 8½c; " 8 c
Litharge... " 6¼c; " 6 c
Dry White Lead..less than 500 lbs., 7¼c; over 500 lbs. 6¾c
White Lead in Oil in lots of less than 500 lbs., ½c additional.
Terms: Note at sixty days, or if paid within 15 days from date of invoice, a discount of 1½ per cent. will be allowed, but not otherwise.

Window Glass.

Per Box of 50 Feet.—Discount 75 @ 75&10 %.

Size.	AA.	A.	B.	C.
Single Strength.				
6 x 8 to 10 x 15	$7.50	$6.75	$6.25	$5.7
11 x 14 to 16 x 24	8.50	7.75	7.25	6.5
18 x 22 to 20 x 30	10.75	9.75	8.75	7.7
15 x 36 to 24 x 30	12.25	10.75	9.00	
26 x 28 to 24 x 36	13.00	11.50	9.75	
26 x 36 to 26 x 44	14.50	13.25	10.75	
26 x 46 to 30 x 50	15.00	14.00	11.25	
30 x 52 to 30 x 54				
30 x 56 to 34 x 56				
34 x 58 to 34 x 60				
36 x 60 to 40 x 60				
Double Strength.				
6 x 8 to 10 x 15	12.00	11.00	10.00	35
11 x 14 to 16 x 24	13.75	12.50	11.75	10.50
18 x 22 to 20 x 30	17.25	15.75	14.00	
15 x 36 to 24 x 30	19.75	17.25	14.50	
26 x 28 to 24 x 36	21.00	18.50	15.75	
26 x 36 to 26 x 44	23.25	21.25	17.25	
26 x 46 to 30 x 50	24.00	22.50	18.00	
30 x 52 to 30 x 54	25.75	23.25	19.25	
30 x 56 to 34 x 56	27.75	25.00	21.75	
34 x 58 to 34 x 60	29.25	27.75	24.00	
36 x 60 to 40 x 60	33.25	30.00	27.75	

An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length and not making more than 81 united inches, will be charged in the 84 united inches bracket.

CHICAGO.

(The Chicago Stamping Co., 10, 12 & 14 Lake St.)

February 17, 1879.

Tin Plate.—
10x14, IC, Ch'l. Good. $ | 14x20, IXX. Ch' Best. 11 00
10x14, IC, " Best, 7 00 | 14x20, IXXX. " " 13 00
10x14, IX, " " 9 00 | DC, 100 Plate " " 7 00
12x12, IC, " " 7 00 | DX. " " 9 00
12x12, IX, " " 9 00 | DXX. " " 11 00
14x20, IC, " " 7 00 | DXXX. " " 13 00
14x20, IX, " " 9 00 | IC, Roofing, " " 6 50
| IX. " " " 8 50
20x28, IC, Charcoal Roofing, Good...
20x28, IC, " Best... 13 00
20x28, IX, " " ... 17 00
10x14, IC, Coke Plates... 6 50
14x20, IC, " ... 6 50
10x20, IC, " ... 9 50

Block Tin —
Large Pigs... 18c | Bars... 20c
Small... 19c |

Zinc.—Sheet, 500 to 1000 ℔. Casks...
Loose Sheets... 7 c
Slab Zinc or Spelter... 5 c

Copper.—Bottoms...27c
Sheathing...25c
Planished...32c
" Boiler lengths...34c
Ingot...
Bolt...24c

Braziers' Sheets.—
30x60, 6 to 7 lbs...℔ ℔ 30c | 30x60, 10 to 12 lbs...℔ ℔ 26c
30x60, 8 to 9 lbs... " 28c | 30x60, 15 to 100 lbs. " 25c

Solder.—F. S. & Co.'s make
Best Fine...14c
No. 1...13c
Roofing...11½c
Braziers-or Spelter Solder...23c

Antimony...15c
Babbit Metal—F. S. & Co.'s...13c
No. 2...10c

Sheet Iron.—

	Common.	Smooth. Com.	Smooth Charcoal.	Smooth Juniata
No. 24	3 c	3 80c	5¾c	7 c
25 & 26	3·20c	4 c	6 c	7¼c
27	3·40c	4·20c	6¼c	7½c

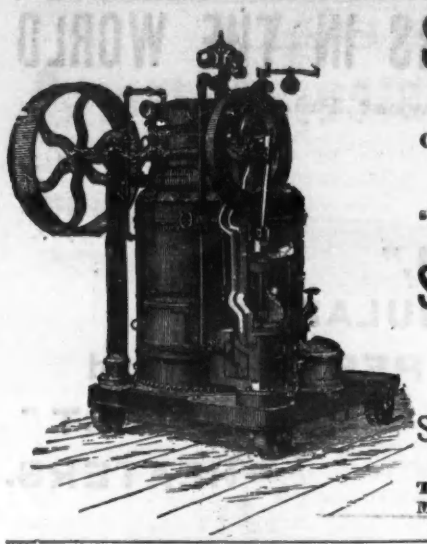
Galvanized Iron.—dis 45 %
No. 16 to 20...12c | No. 27...15c
21 to 24...13c | 28...16c
25 & 26...14c |

Russia Iron.— | No. 1 Stained...13½c
Perfect...14c | In Sheets, 1c. higher.

American Russia.— | B...9½c
A...10½c | In sheets, 1c higher

Lead.— | Lead Pipe, in full coils 5½
Pig... 5 c | Lead Pipe, when cut.. 6
Bar... 5¾c | Sheet Lead... 6½

Wire—Bright...dis 50 %
Coppered...dis 45 %



SHAPLEY ENGINE.

Patented - - - Feb. 10, 1874.
Reissued June 22, 1875.

Compact, Practical, Durable and Economical.

Acknowledged to be the best in use. This boiler stands unrivaled.

MANUFACTURED BY

SHAPLEY & WELLS,

Binghamton Iron Works,
Binghamton, N. Y.

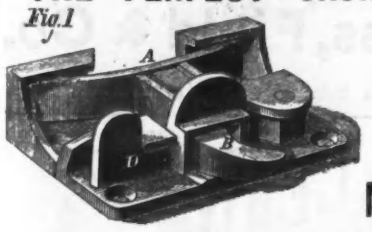
MANUFACTURERS OF

Stationary Engines and Boilers.

Also **Machinery for Mills** of all kinds and **Tanneries.** Also their celebrated **Bark Mills,** acknowledged to be the best.
Send for reduced price list circular.

THE PERFECT SASH TIGHTENER AND LOCK.

Fig. 1



Manufactured entirely from Malleable Iron, Burglar Proof, Anti-Rattling, Draws Sash to Exact Center. No Springs to Get out of Order.

The Best in the Market.

METALLIC CLOTHES PIN,

For either Wire or Rope Line,

Will securely hold any article, from a silk handkerchief to a carpet. No article can be blown away. Does not soil the clothing. Manufactured by

CLARK & SMITH, Patentees, Chester, Orange Co., N. Y.

SOLE AGENTS,

J. I. BROWER & SON,

286 Greenwich St., New York,

Who keep a general assortment on hand for the country trade. **Jowett's Horse Rasps,** 14, 15 and 16 inch, **Maharay's $10 Tire Shrinker, Heller's Rasps.** Send for Circular.

SPECIAL DISCOUNTS TO JOBBERS.

Bemis & Call Hardware & Tool Co.

This Wrench can be furnished with Briggs' Pat. Nut or Sleeve.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench, thus making a combination which has no equal

For Circulars and Price List, address

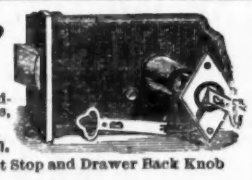
BEMIS & CALL HARDWARE & TOOL CO., Springfield Mass.

Wilson Bohannan,

Manufacturer of Patent

BRASS PAD LOCKS

For Railroad Switches, Freight Cars, and the Hardware Trade. All sizes, with Brass and Steel Keys, with and without chains.



Patent Horizontal Rim Cylinder Night Latch.

Self-adjusting to doors of any thickness, with Patent Stop and Drawer Back Knob RIGHT OR LEFT HAND.

PASSENGER CAR LOCKS, Bronzed, Nickel-Plated and Japanned

☞ Catalogues and Samples sent upon application. **BROOKLYN, N. Y.**

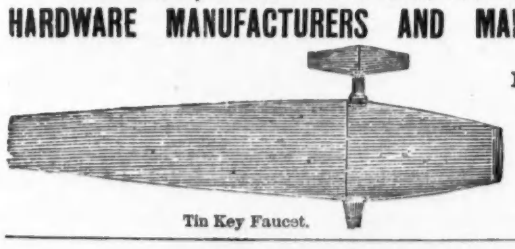
MALTBY, CURTISS & CO., No. 34 Reade St., N. Y.,

HARDWARE MANUFACTURERS AND MANUFACTURERS' AGENTS.

Sole Agents for the

NORWICH PISTOL CO.

Send for circular and price list.

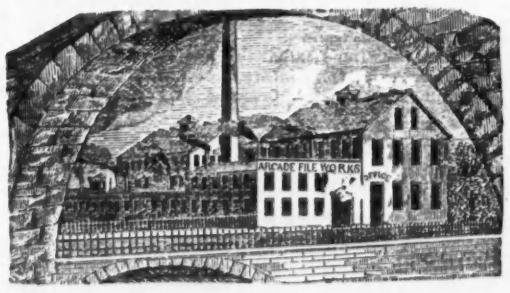


Tin Key Faucet.

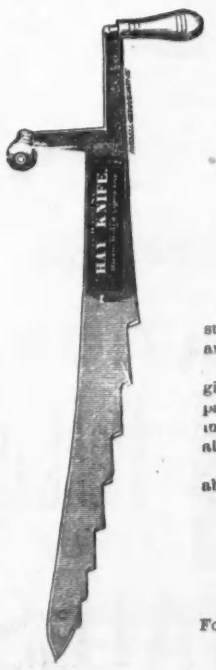
Capewell's Giant Nail Puller.

ESTABLISHED 1848.

C. T. DRAPER & CO.
Sing Sing, N. Y.
Manufacturers of SUPERIOR
HAND CUT



FILES and RASPS
Made from Best
ENGLISH CAST STEEL.
Quality guaranteed by written warranty when required.



LIGHTNING HAY KNIVES,

WEYMOUTH'S PATENT.

This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marches.

The blade is best cast steel, spring temper, easily sharpened, and is giving *universal* satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and *seems destined* to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each, of 50 lbs. weight, suitable for shipping by land or water to any part of the world.

Manufactured only by

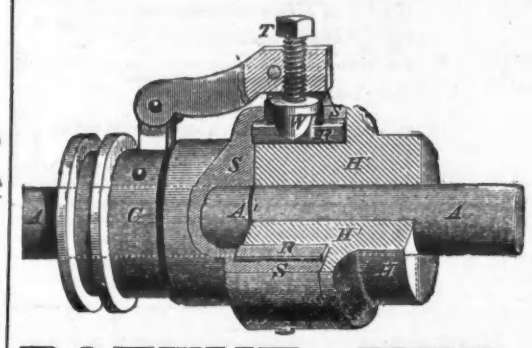
Hiram Holt & Co.,

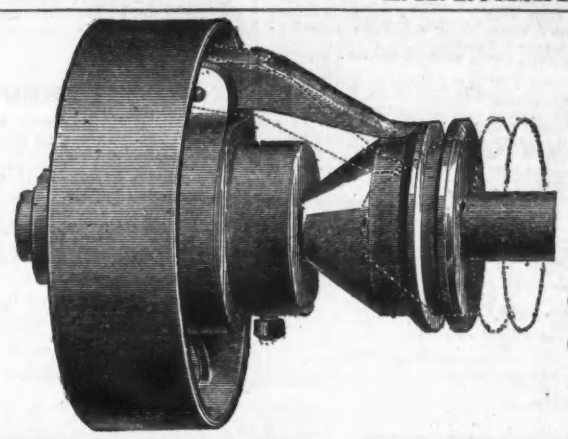
East Wilton, Franklin Co., Maine.

For sale by the Hardware Trade generally.

SEMPLE & BIRGE MFG. CO., Agents at St. Louis.

PATENT
Expanding, Self-Draining
RUBBER BUCKET.
Manufactured only by
L. M. RUMSEY & CO.





HUB FRICTION CLUTCH.

James Smith & Co., Mfg. Agents

PATENT HUB FRICTION CLUTCH.

Manufactured by the **HUB FRICTION CLUTCH CO., Limited, Philadelphia.**

We claim for this device the following advantages for a perfect clutch, it having been adopted by several of the leading manufacturers of machinery and machinists' tools: It works easily but effectively. It works instantly and without noise. It is very durable, and is extremely simple and cheap, and has proven itself to be the best clutch in the market. Special arrangements can be made with leading manufacturers for the adoption of this clutch for their own tools. This clutch can and will be sold for less money than any other clutch in the market.

For sale by GEO. V. CRESSON, Philadelphia; MORTON, REED & Co., Baltimore.

JAMES SMITH & CO., Mfg. Agents, 137 Market Street, Philadelphia.

H. S. MANNING & CO., NEW YORK AGENTS, 111 Liberty Street.

THE EAGLE ANVIL!! WARRANTED!!

(ESTABLISHED) 1843.

These Anvils are *superior* to the best English, or other Anvils, on account of the peculiar process of their manufacture (invented and used only by this concern), and from the quality of the materials employed.

The best English Anvils become hollowing on the face by continued hammering in use, on account of the fibrous nature of the wrought iron—causing it to "settle" under the face.

The body of the Eagle Anvils is of crystallized iron, and no settling can ever occur; the steel face, therefore, remains perfectly true. Also, it has the great advantage, that being of a more *solid* material, and consequently with less rebound, the piece forged receives the full effect of the hammer, instead of a part of it being wasted by the rebound, as of a wrought iron anvil. An equal amount of work can, therefore, be done on this Anvil with a *hammer one-fifth lighter* than that required when using a wrought iron anvil.

The working surface is in *one piece* of JESSUP'S BEST TOOL CAST STEEL, which, being accurately ground, is hardened and given the proper temper for the heaviest work. The *horn* is covered with and its extremity made *entirely of steel.* The body of the Anvil is of the strongest grade of American iron, to which the cast-steel face is *warranted to be thoroughly welded and not to come off.*

Price List, October 1st, 1876. ANVILS weighing 100 lbs. to 800 lbs., 9c. per lb. Smaller Anvils, ("Minims.")

No.	00	0	1	2	3	4	5	6	7	8	9
Weighing about	5 lb.	10 lb.	15 lb.	20 lb.	30 lb.	40 lb.	50 lb.	60 lb.	70 lb.	80 lb.	90 lb.
	$2·25	$2·75	$3·25	$4·00	$4·50	$5·25	$6·00	$6·50	$7·25	$8·00	$8·50

N. B.—These are the RETAIL PRICES. The only additional cost will be the freight to the purchaser's place of residence.

THESE GOODS ARE SOLD BY THE GENERAL AGENTS (with special discounts to the trades.)

New York.—Messrs. TENNIS & WILSON.—RUSSELL & ERWIN MFG. CO.—Messrs. HORACE DURRIE & CO., Boston.—Messrs. GEORGE H. GRAY & DANFORTH. Philadelphia.—Messrs. JAMES C. HAND & CO. Baltimore.—Mr. W. H. COLE Louisville.—Messrs. W. B. BELKNAP & CO.

FISHER & NORRIS, Sole Manufacturers, Trenton, N.J.

The Patent Combined
Dinner-Pail and Lantern.

The most perfect Dinner Pail in the world. Hot coffee for dinner and a Lantern at night

Manufactured by JOS HAIGHT
PORT CHESTER, N. Y

Sent by express on receipt $1.00. Special attention given to export orders. Traveling Agents Wanted.

PHOSPHOR-BRONZE.

TRADE MARKS.

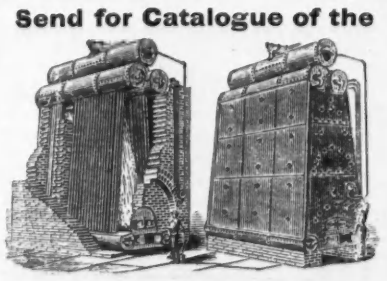
Bearings, Pump Rods and Spring Wire.

"Phosphor-Bronze."

Apply to

The Phosphor-Bronze Smelting Co., Limited,
2038 Washington Avenue, Philadelphia.

Send for Catalogue of the



FIRMENICH

Safety Steam Boiler.

For Burning Smoke and all Gases from Coal and all kinds of Fuel.

J. C. & F. FIRMENICH,

Office, *13 Mortimer Street, Buffalo, N. Y.*

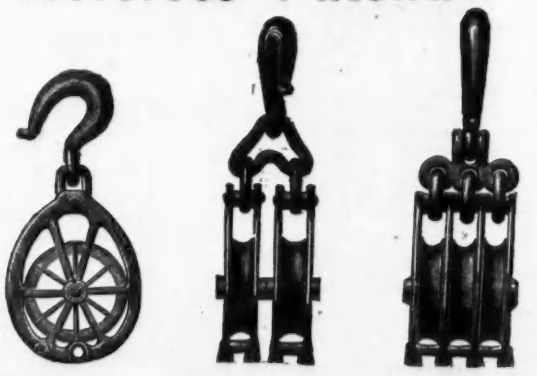
PERFECTION CHUCK.

Four Steel Jaws. Four inch turned shank to fit any lathe. It will take from smallest drill to a full 3-16. Warranted fully. Price $1.50. Discount to trade. Pin Vises on same principle and at same price.

JAMES D. FOOT,
No. 40 Broadway, New York.

NEW IRON TACKLE BLOCKS.

Norcross Patent.



Galvanized Malleable Iron Shell and Sheave, Steel Hooks, Steel Pins.

Superior to Wood Blocks on account of not Checking and Cracking.

The Strongest, Lightest, Easiest Running and most Durable Block yet produced.

Send for sample and price list of same to

Providence Tool Co.,

PROVIDENCE, R. I.

Or to **J. H. Work, 13 Pearl St., Boston, Mass.; S. H. & E. Y. Moore, 68 Lake St., Chicago, Ill.; Henry B. Newhall, 11 Warren St., N. Y.**

HENRY B. NEWHALL 11 WARREN ST. N NEW YORK AGENT.

HUNDLEY & HANKS,

PROPRIETORS OF

NORTH CAROLINA HANDLE CO.

MANUFACTURERS OF

Handles and Spokes,

79 Reade Street and 97 Chambers Street, - - - NEW YORK,

HARDWARE COMMSSION MERCHANTS.

BOSTON.
Reported by Macomber, Bigelow & Dowse, 156 to 164 Oliver St.

Anvils.—"Eagle American" ₩ lb cc. dis 20 %
Apple Parers.—Reading ₩ doz $4.00
Lightning ₩ doz 6.50
Reading "78" ₩ doz 7.50
Aiken's Tools dis 40&10 %
Anvil & Vise.—
No. 1, $4.50; 2, 3.75; 3, 5.00 each dis 25 %
Augurs & Bitts.—Snell's Auger dis 50 %
L'Hommedieu's Ship Augers dis 15 %
Jenning's Bitts dis 10& 10 %
Cook's Bitts dis 40 %
Shepardson's Double-Cut Bitts dis 45 %
" " Gimlets dis 45 %
Stearn's Extension Hollow Augers per doz $36.00
Bonney's " " " per doz 33.00
Axes.—Blue Jackets per doz 8.00
Red Cross per doz 7.50
" Handled per doz 9.50
Dowse " Boys' dis 15 %
Ax Handles.—
Oak Extra, 31 in., No. A ₩ doz $2.25
" 34 in., No. A ₩ doz 2.50
" 31 in., No. B ₩ doz 1.75
" 34 in., No. B ₩ doz 2.00
" 31 or 34 in., No. C ₩ doz 1.25
Axle Clips dis 60 %
Balances.—Chatillon's dis 25&10 %
Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers) per ft. 30
" Half-Round per ft, ⅝, 2½c; ⅞, 4½c
Wrought " per ft, ¾, 3½c; ⅝, 4c; ¾, 5c
Bells.—Connel's Crank Gong dis 40&10 %
Bird Cages.
Japanned M. B. & D., reduced list, 1878 dis 25 %
Brass " " 1878 dis 25 %
Blind Fasts.—Lock Fasts ₩ C sets $4.00
No. 6 Fasts ₩ C sets 4.00
Veazie Fasts ₩ C sets 7.00
Shedd's ₩ C sets 8.00
Blind Hinges.—Mall. Hook, 3 holes ₩ C sets 5.00
Brad Awl Handles.—
Phœnix Adjustable ₩ doz $2.00
Bolts.—Norway Iron Carriage dis 70&10 %
Common " dis 75&10 %
Borax.—Refined ₩ lb 100
Boring Machines.—Snell Upright each, $3.25
Snell Angle each, 4.00
" Augers ₩ set 1.75
Braces.—Barber's dis 40& 5 %
Spofford's dis 50 %
Backus' dis 60 %
Bracket Saws.—Roger's each $2.25
Bracket Saws, extra quality, to No. 6 ₩ gro 90c, $1
Steel Frame, with patterns ₩ doz 7.50
Lester dis 25 %
"Holly," all iron each, $2.25
Brackets.
H. B. & M. Flower Pot dis 50 &10 %
Bronzed Shelf, M. B. & D. list dis 10&10 %
Bread Kneader.—Stanyan dis 25 %
No. 4 capacity 3 loaves ₩ doz $24.00
No. 5 " 5 " ₩ doz 27.00
No. 6 " 8 " ₩ doz 33.00
Bronze Hardware.—Norwalk Lock Co. dis 50&10 %
Butts.—Union Fast Joint dis 50& 10 %
" Loose " dis 75&5 %
" Japanned Acorn dis 75&5 %
" Silvered " dis 75&5 %
" Boston Fihish dis 75&10 %
Centennial Spring dis 25 %
Carriage Jacks.—Climax ₩ doz $15.00
" large size ₩ doz 18.00
Cartridges.—U. S. Cartridge Co dis 60 %
Cards.—Sargent Horse and Curry dis 33⅓&10 %
" Cotton dis 25&10 %
" Wool dis 25&10 %
Casters.—Bed and Table dis 50&10 %
Chain.—Traces 6½, 10, 4, streight ₩ pair 45c
" 6½, 10, 4, twisted ₩ pair 50c
" 7, 12, 2, " ₩ pair 75c
Coil 3-16 ₩ lb 10c
" ¼ ₩ lb 8c
" 5-16 ₩ lb 7c
" ⅜ ₩ lb 6c
" 7-16 ₩ lb 5¾c
" ½ ₩ lb 5½c
Ch ik.—White, Carpenter's ₩ gross 55c
Red, Carpenter's ₩ gross 75c
Blue, " ₩ gross 90c
Chisels.—Hart, Bliven & Mead, Framing dis 70 %
Underhill, Framing dis 25 %
Buck's Shank, Framing dis 25 %
Clothes Line.—
Galvanized Wire, 100 feet each ₩ doz $4.50
Coal Hods.—Ironclad.—Galvanized dis 25 %
Japanned dis 30 %
Copper Rivets. dis 25 %
Cocks.—Brass, L. F. & C dis 50 %
Cordage.—Manila, usual trade dis ₩ lb 12c
Jute ₩ lb 9c
Cow Ties. dis 45 %
No. 30, 3 ft. No. 6 Wire, with toggle ₩ doz $2.00
No. 35, 3 ft. " " with snap ₩ doz 3.80
No. 40, 3½ ft. " " with toggle ₩ doz 3.90
No. 45, 3½ ft. " " with snap ₩ doz 4.10
No. 50, 4 ft. No. 4 " with toggle ₩ doz 4.50
No. 55, 4 ft. " " with snap ₩ doz 4.75
No. 60, 4½ ft. " 3 " with toggle ₩ doz 5.38
No. 65, 4½ ft. " " with snap ₩ doz 5.62
Crow-Bars.—Cast Steel ₩ lb 8c
Iron, Steel Pointed ₩ lb 5c
Cutlery.—Pocket, American Shear Co.'s dis 33⅓&10
Butcher Knives, "Woods," Lap Bolster, Square Handle dis 33⅓ %
Steak Knives dis 20 %
Lap Bolster, Oval Handle dis 25 %
Sticking dis 33⅓ %
Skinning dis 33⅓ %
Butcher, Common Round Handle, "Woods" dis 25 %
Shoe Knives, " " dis 10 %
Dividers.—Cook's dis 25 %
Dog Collars dis 20 %
Dog M zzles.—Automatic dis 15 %
Door Springs.—Torrey's Rod ₩ doz $7.00
Gem Coil dis 10 %
Eccentric Steel Coil Spring, No. 1 ₩ doz $2.75
Door Stops.—"Thurston's" dis 50 %
Drawer Knobs.—"Thurston's" dis 50 %
Drills.—Morse Bitt Stock dis 25 %
Morse Straight Shank dis 20 %
Emery.—Wellington Mills ₩ lb 10c
Alden's ₩ lb 6c
Enamelled Ware.
Standard Mfg. Co. Kettles dis 60 %
" Sauce Pans dis 35 %
Felloe Plates.—Wrought ₩ lb 8c
Files.—Madden & Cockayne dis 50 %
American File Co dis 40 %
Nicholson " dis 35 %
Fluting Machines.
Knox, with 6 inch rolls ₩ doz $36.00
Geneva ₩ doz 13.50
Rochester ₩ doz 12.00
Forks.
W. C. & Co., Manure, reduced list dis 15&10 %
Gimlet Bitts.
Genuine German, No. 125, 1-32 to 8-32, $1.00; 10-32, $1.10; 12-32, $1.20 ₩ doz gold.
Glass Cutters.
Combination Class Cutter and Knife Sharpener ₩ doz $1.25
Grub Hoes.—K. P. & Co.'s No. 2 ₩ doz 7.50
Hammers.—Maydole's dis 15 %
Hammond's dis 20 %
Dowse's Steel, A. E. ₩ doz $4.00
M. B. & D. dis 25 %
Hangers & Rollers.—Anti-Friction dis 60 %
Climax dis 50 %
Novelty dis 40 %
Common dis 50 %
Hand Screws dis 20 %
Hatchets.—Dis. 15 %
C. F. Dowse, Combination per doz. $10.00
Underhill dis 25 %
Hay Knives.—Lightning ₩ doz $18.00
Hinges.—Strap and T (new list) dis 60&10 %
Providence Plate ₩ lb 4c
Wrought Screw Hook ₩ lb 4c
Hoes.—W. C. & Co.'s (reduced list) dis 15&10 %
Hooks and Staples.—Brewers' dis 50 %
Horse Nails. No. 6 7 8 9
National Finished .23 .21 .20 .19 dis 15 %
Putnam Pointed .23 .21 .20 .19 net
Horse Nails.—Bridgewater dis 25 %
No. 6, 23; No. 7, 21, No. 8, 20; No. 9, 19.
Knobs.—"Norwalk"
Mineral ₩ doz $0.75
Porcelain, Japanned Mtg ₩ doz .85
" For. Rose Nickel Mtg ₩ doz 2.60
" Plated " ₩ doz 2.50
Silver Glass ₩ doz 8.00
" Bell Pulls ₩ doz 6.00
Lanterns.—Tubulars, No. 0 ₩ doz 10.00
Railroad, Oil, No. 43 ₩ doz 8.00
Guarded, Oil and Candle, No. 25 ₩ doz 3.50
Triangular ₩ doz 4.00
Hurricane dis 20 %
Lead.—Sheet ₩ lb 5½c
Pipe ₩ lb 4½c
Locks.—Norwalk Lock Co. (reduced list) dis 50&10 %
Eagle Cabinet dis 25 %
" Trunk dis 25 %
W. Wilcox & Co., Padlocks dis 33⅓&5 %
American Lock Co.'s Steel Key dis 33⅓ %
Metallic Sieves.—Mann's Patent dis 33⅓ %
Manure Forks.—W. C. & Co. (r'duc'd list) dis 15&10 %
Mattocks.—K. P. & Co., Long Cutter ₩ doz $9.50
K. P. & Co., Short Cutter ₩ doz 9.00
" Pick " ₩ doz 9.00
Measuring Tapes.—Eddy's dis 20 %
Meat Cutters.—Mlies' Challenge dis 30 %
Hale's dis 50 %
American dis 25 %
Money Drawers.—Tucker's Alarm ₩ doz $27.00
Mouse Traps.—Delusion ₩ doz 2.00
Oilers.—Zinc and Tin dis 50 %
Brass and Copper dis 50 %
Ox Bows.—Extra finished and varnished dis 10 %
1¼ in., ₩ doz. pair..$5.75 | 2 in., ₩ doz. pair....$9.00
1¾ in., " " 8.00 | 2½ " " 11.00
Padlocks.—W. Wilcox & Co.'s dis 33⅓&5 %
Miller's Brass ₩ doz $9.00
Picks.—K. P. & Co., Adze Eye, 5 to 6 lb ₩ doz 6.50
" " " 6 to 7 lb ₩ doz 7.00
Planes.—Auburn Tool Co dis 35 %
N. Y. Tool Co dis 50 %
English Iron dis 30 %
Bailey's dis 25&10 %
Plated Ware.—Rogers & Bro dis 40&5 %
Pliers.—Vom Cleff & Co.'s Gold lis %
Button's Wire Pliers dis 33⅓ %
Plumb & Levels.—Stanley, R. & L. Co. dis 60&10 %
Pocket Knives.
American Shear Co.'s dis 33⅓&10 %
Potato Diggers.
W. C. & Co. reduced list dis 15&10
Pulley Blocks dis 3/4
Pumps.—Union Manufacturing Co.
Iron Cistern dis 55
" Pitcher Spout dis
Copper dis
Rivets.—Black dis
Carriage in 10 lb papers dis 40
Copper dis 25
Razor Strops.—Torrey's ₩ doz list
Rules.—Stanley, Boxwood, dis 50&10 %
" Ivory, dis 40&10 %
Sadirons.—Common ₩ lb 2½c
Laundry ₩ lb 4c
Tailor's Goose ₩ lb 5c
Enterprise, "Potts" dis 33⅓ %
Mrs. Potts' Large Polishing, Nickeled ₩ doz net $1.50
Sash Locks.—King & Hutchinson's, new list dis 40 %
Hopkins & Dickinson's dis 40 %
Sandpaper.—Baeder & Adamson dis 15 %
M. B. & D. dis 20 %
Sash Weights.—Patent Eye ₩ lb 1½c
Saws.—Hand Saws, Disston's dis 20 %
Wheeler & Clemson dis 20&5 %
Cross-Cut Saws.
W. M. & C., Common Tooth, No. 1 ₩ foot 35c
" " Champion " ₩ foot 35c
Disston's, Common " ₩ foot 44c
" " Gt. American " ₩ foot 44c
Boynton's Lightning " ₩ foot 45c
Saw Setts.—Spring Lever ₩ doz $10.00
Saw Blades.—Disston dis 20 %
W. M. & C. dis 20&5 %
Welch & Griffith, Extra ₩ doz $3.60
" " No. 2 ₩ doz 2.00
Scales.—Fairbanks dis 25 %
Howe dis 25 %
Screws.—Aiken's Flat-Head Iron dis 60 %
American Flat-Head Iron dis 60 %
" " Brass dis 45 %
" Round-Head " dis 30 %
" " Iron dis 45 %
Grilley " Nickel-plated Piano dis 50&5 %
" " Common dis 50 %
Shaves.—Kimball's ₩ inch 75c
Watrous dis 15 %
Shears.—American Shear Co dis 75 %
Shot.—Tatham's ₩ lb 6c
Shovels.—O. Ames dis 33⅓ %
O. Ames, other brands dis 37½ %
M. B. & D. dis 37½&5 %
Oxford, Birmingham Pattern dis 40 %
Snow Shovels.—Malleable tips ₩ doz $5.00
Skates.—Union dis 25 %
Acme dis 20 %
Spoons.—Tinned Iron dis 15 %
Britannia dis 50
Rogers' A No. 1 dis 40&5
Stock and Dies.—King's dis 10&5
Tacks.—A. Field & Son's dis 50&10
Pittsfield dis 50&10
Traps.—Oneida, Genuine dis 33⅓
Oneida, Imitation, H. & N dis 50&10 %
Blake's dis 50&10 %
Tree Scrapers.—No. 1 ₩ doz. $2.00
No. 2 ₩ doz 3.00
No. 3 ₩ doz 4.00
Vises.—Solid Box, Blacksmith's ₩ lb 10½c
Simpson's Adjustable dis 25&10 %
Howard Vise Co. dis 33⅓ %
P. L. & Co., Solid Blacksmiths', new list dis 10 %
Weather Strips.
Browne's Flexible Rubber dis 30 %
In 20 feet boxes; No. 1, ⅛ in. wide, ₩ yard, 10c.; No. 2, ⅜ in., 15c.; No. 3, ¾ in., 20c.; No. 4, 1 in., 25c.
Valentine's Felt Moulding dis 30 %
Black Walnut Spring Weather Strips ₩ doz. $3.00
Window Awning.
Dearborns' per window; $1.00, dis
Window Springs. dis 10 %
Babcock's No. 3 ₩ gross $5.25
" " 4 ₩ gross 4.50
Wire Goods.—Gate Hooks and Eyes, &c. dis 70&10
Wrenches.—A. G. Coe's dis 60
Girard Mfg. Co. dis 60&10
Wringers.—Universal, No. 2 ₩ doz $6.00
Universal, No. 2½ ₩ doz
Novelty, No. 10 ₩ doz
" No. 2 ₩ doz 6[illegible]
" No. 22 ₩ doz 7[illegible]
Excelsior, No. A ₩ doz
" No. B ₩ doz 8[illegible]
" No. CC ₩ doz 10[illegible]
Novelty Set Tub, E. ₩ doz 60.00
Eureka ₩ doz 54.00
Zinc. ₩ lb
Withington, Cooley & Co.—Hoes, Rakes, Forks, &c. dis 40 %. Special rate for Export.

St. Louis Metal Market.
(Corrected Weekly by Messrs. R. Sellew & Co.)

Tin Plate.

IC. 10x14, Best Char.	$ 7 25	DX, 12½x17, B Char.	$ 9 5
IX. 10x14, " "	9 25	DXX, 12½x17 " "	11 25
IC. 12x.2, " "	7 25	DXXX, 12½x17 " "	13 5
IX, 12x12, " "	9 25	DXXXX, 1.½x17, " "	15 25
IC, 14x20, " "	7 25	IC, 20x28, " "	17 50
IX, 14x20, " "	9 25	IX, 20x28, " "	21.50
IXX, 14x20, " "	11 25	IXX, 20x28, " "	21 50
IXXX, 14x20, B. Char.	14 25	IC, 14x28, Best Roof..	6 75
IXXXX, 14x20, " "	15 25	IX, 14x.0, " "	8 75
IC, 12x24, " "	7 5	IC, 20x28, " "	13 75
IX, 1?x ?, " "	9 5	IX, 20x28, " "	17 25
IC, 14x14 " "	13 25	IC, 10x14, Best Coke..	6 00
IX, 14x14, " "	15 25	IC 14x20, " "	6 00
IXX, 14x14, " "	16 25	IC, 10x20, " "	9 75
DC, 12½x17, " "	7 25	Pr box 225 sh's Safe Tin	6 50

Sheet Iron.	Com'n.	Sm'th.	Sm'th.	Sm'th
		B L U	D. Ref'd	Cast'l
No. 16 to 20	3½c	5 8c	5 6c	6 0c
No. 22 to 24	3 0c	3 8c	5 0c	7 0c
No. 26	3 10c	3 9c	5 c	7 c
No. 27	3 20c	4 c	5 2c	7 4

Genuine Russia Iron.
Perfect.—No. 9, 10, 11, 12 per lb. 18½
No. 1 Stained.—No. 9, 10, 11, 12 per lb. 18
Tare 22 lbs. to Bdle. For less than Bdle. add 1c. ₩ lb
Patent Finished Iron
No. 14 to 27, Quantity per " 10½c
" 28 " " 9½c
For less than Bdls. add 1c. per lb.
Galvanized Sheet Iron.
Juniata, or 1st quality, Discount for full bundles 45 %
Block Tin.

Banca, Large Pigs	31c	do. Small	18
Straits, Large Pigs	17c	Bar	19c
Eng. Ref'd, Large Pig	17c		

Solder.

Extra in Bars	12c	No. 2, in Bars	9½c
No. 1, in "	11c	Spelter Solder	24c
Pig Lead—Pigs	4c	In Bars	5c
Antimony			14c
Bismuth			$1 75
Nickel			2 00
Crucibles.—Dixon's			₩ No. 4½c

Babbit Metal.

No. 1	₩ lb. 16c	No. 3	₩ lb 11 c
" 2	" 14c	" 4	" 7½c

Copper.

Brazier's, 30x60,	14 to 100 lbs. Sheets		14c
" " "	10, 11 & 12 lbs., "		13c
" " "	8 and 9 lbs. "		13c
" " "	6 and 7 lbs. "		12c
Tinned, 14x48, 14 and 16 oz.			24c
Planished, 14x48, 14 and 16 oz.			18c
" Boiler Sizes. 14 and 16 oz.			35c
Gutter Copper, 20 and 24x72, 10, 11 and 12 lb. Sheets			18c
" 14 lb. Sheets			16c
Reservoir Copper, 16x60 and 18x60			6?c
Bar Copper, Square and Round, ⅜ to 1⅜ inch			22c
" " ⅝ inch			19c
Copper Bottoms			28c
Soldering Coppers			40c

Brass.

Roll, No.	10 to 28, 12 in. in width		25c
"	30, 12 in. in width		26c
"	32, 16 "		32c
"	34, 16 "		34c
"	36, 16 "		36c
Platers, No. 40, 6			4

Discount 10 per c. nt.

Brass and Copper Wire.

	Brass.	Copper.		Brass.	Copper.
No. 0 to 20	28c	34c	No. 24	35c	41c
" 21	31c	41c	" 25	38c	46c
" 22	32c	4 c	" 26	40c	50c
" 23	33c	43c	" 27	45c	54c

Brass Spring Wire, 2c. ₩ lb advance.
Discount 10 per cent.

Brass Tubing.

Plain ⅛ to 3 inch	38c	5-16 inch	8
¼ inch	38c	⅛ "	6 c
Copper Rivets and Burs			dis 25 %
Brass Kettles 5 to 13 inches			₩ lb 5
" " all sizes over 13 inches			" 46
Sheet Zinc.—600 lbs. cask			" 5½ c
250 lbs. cask			" 6c
Sheet			" 6½ c
Wire.—Iron, Bright Market			dis 50
Iron, Coppered Market			dis 40
Fence, Nos. 7, 8 and 9			₩ lb 2½c
Trellis, Nos. 10 and 11			4½c
" No. 14			5 c
Hay Baling, Charcoal, No. 10 and 11			" 6 c
" " No. 12			7½c
Broom, Tinned, Nos. 18 to 22			
Fence Staples			per keg 5
Per lb			6
Iron Rivets.—Black, papered			dis 125 %
Tinned, papered			dis 75 %
In bulk	new 5-16	⅜ 5-16	⅜ in dis 2
	7½c	7?c 6½c	6½ per lb
Tacks.—New Hardware List			dis 50
Sad Irons			₩ lb 12½
Enameled Kettles.—Standard Mfg. Co.			
Enameled Sauce Pans.			
Standard Mfg. Co.			dis 40
Enameled Boilers.—Standard Mfg. Co.			dis 40
Dripping Pans.—Smooth Iron			₩ lb 8½
Geneva Platers			per doz $1.25
Monroe Platers			" 12c
Stove Polish.—Dixon's			per gross
Gem			
Japanese			
Dixon's, in bulk			₩ lb
Coffee Mills.—Parker's			dis 40
Granite Iron Ware			₩ lb 30
Spoons.—New List			dis 50
Retinned Iron Ware			dis 60 & 10 %
Plain Stamped Ware			dis 60 & 10 %
Japanned Ware.—St. Louis List			dis 1 %
Fry Pans			dis 1 %
Lard			dis 40 %

Machinery, &c.

THE JUDSON GOVERNOR.

It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the accompanying list. We guarantee the Judson Governor will do all any other Governor can do, and in accuracy and durability—the main essentials—we guarantee it shall do more.

Reduced Price List,

OCTOBER 15, 1878.

☞ For dimensions of Governor, see Illustrated Price List.

THE JUDSON PATENT

Improved Steam Governor.

Size, Inch.	Plain.	Bright Finished.	Extra for Spe'd'r	Stop Valve.
½	$15.00	$17.00	$1.90	....
¾	16.00	18.00	1.90	....
1	18.00	20.00	2.00	....
1¼	20.00	23.00	2.25	....
1½	23.00	27.00	2.50	$6.00
2	27.00	31.00	2.75	7.50
2¼	32.00	37.00	3.25	9.00
2½	36.00	41.00	3.50	11.00
2¾	40.00	46.00	3.75	12.00
3	45.00	52.00	4.25	14.00
3½	54.00	62.00	4.50	17.00
4	64.00	73.00	5.00	21.00
4½	74.00	84.00	5.50	25.00
5	84.00	95.00	6.00	31.00
5½	97.00	109.00	6.50	37.00
6	112.00	125.00	7.00	42.00
7	132.00	146.00	8.00	50.00
8	160.00	176.00	9.00	60.00
9	180.00	198.00	10.00	75.00
10	200.00	220.00	12.00	....

No Charge for Boxing or Cartage.

JUNIUS JUDSON & SON, Rochester, N. Y.

HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO.

Issues Policies of Insurance after a careful inspection of the Boilers.

COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery.

ARISING FROM

STEAM BOILER EXPLOSIONS.

The Business of the Company includes all kinds of STEAM BOILERS.

Full information concerning the plan of the Company's operations can be obtained at the

COMPANY'S OFFICE, HARTFORD, CONN.,

or at any Agency.

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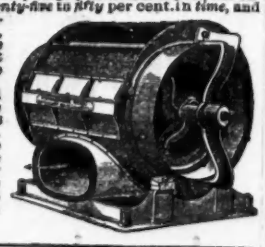

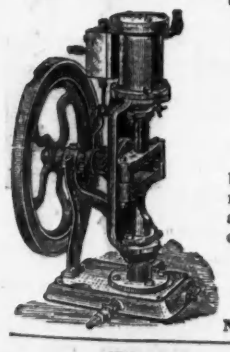

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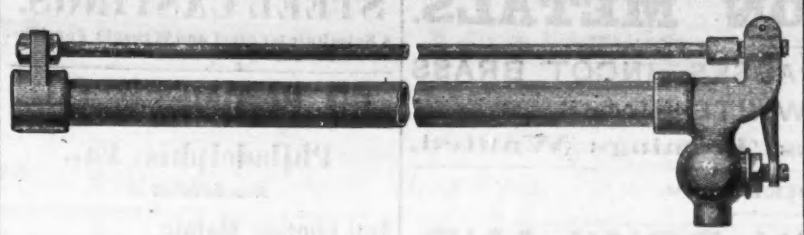

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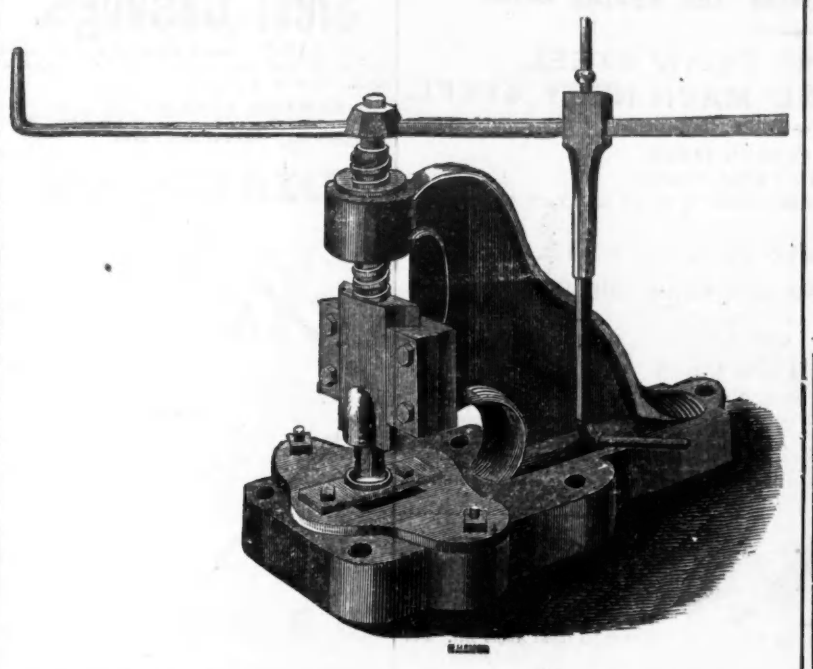

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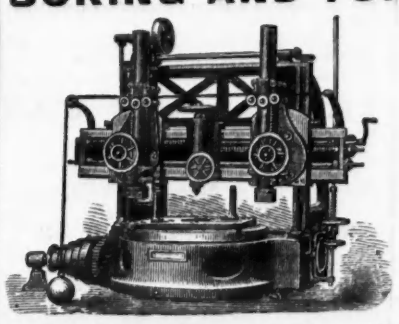

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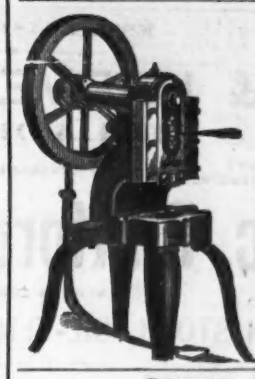

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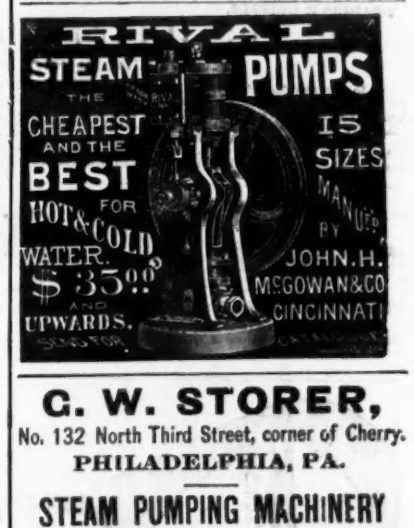

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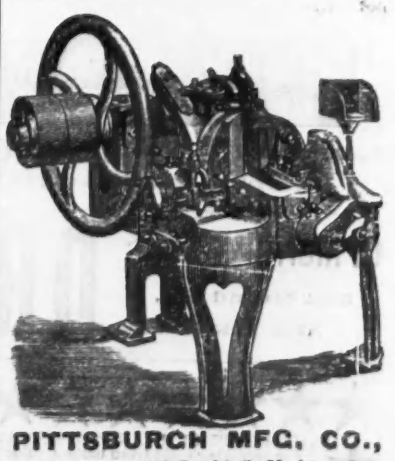

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